LIBRARY OF TRINITY COLLEGE NO. CAROLINA

MANUFACTURERS' RECORD

A WEEKLY SOUTHERN INDUSTRIAL, RAILROAD AND FINANCIAL NEWSPAPER

Trade-Name Registered in the U. S Patent Office.

VOL. LVI. No. 26. WEEKLY. | BALTIMORE, JANUARY 6, 1910 | $4.00 A YEAR. SINGLE COPIES, 15 CENTS.

Manufacturers' Record.

PUBLISHED EVERY THURSDAY BY THE
MANUFACTURERS' RECORD PUBLISHING CO.
BALTIMORE.

RICHARD H. EDMONDS, President
FRANK GOULD, Vice-President.
VICTOR H. POWER, Treasurer.
I. S. FIELD, Secretary.

RICHARD H. EDMONDS,
Editor and General Manager.

EDWARD INGLE, Managing Editor.

ALBERT PHENIS,
General Staff Correspondent.

Branch Offices:
New Orleans—1012 Maison Blanche.
New York—52 Broadway.
Boston—170 Summer Street.
Chicago—1116 Fisher Building.
St. Louis—543 Century Building.

Subscription, - - - - - - - - - - $4 a year (payable in advance) to United States, Mexico, Cuba, Porto Rico, Hawaii and the Philippines.
To Foreign Countries (including Canada) in the Postal Union, $6.50 a year.

[Entered at the Baltimore Postoffice as second-class matter.]

BALTIMORE, JANUARY 6, 1910.

APPEALING TO THOUSANDS.

There are many notable articles in this issue. They cover a wide range, and appeal to every intelligent, thinking man. We feel disposed to guarantee that there is not a single reader of the MANUFACTURERS' RECORD, nor, for that matter, a single man anywhere, to whom some of the facts presented in this issue will not be new and of much interest. The 30 or more special contributors have given our readers a vast fund of information, but every one of these writers, however broad may be his knowledge, will find in the work of his fellow-laborers much of value that is new to him. The pictures will of themselves tell a story of profound interest. Some of them show to the eye, and thus to the mind, the character of splendid buildings of every kind which have been going up in all parts of the South from Maryland to Texas and Oklahoma; others indicate the development in iron and steel plants and other leading industries pointing to the time when this section is to become one of the world's greatest industrial centers; others clearly indicate the wonderful fertility of drained lands in the South, and show by photographs corn that can be reached only by a stepladder, vast rice-field operations, fruit-growing and trucking on land that was regarded a few years ago as untillable. Increasing wealth is clearly indicated in the splendid church buildings, of which a few illustrations are given, now under construction or planned for many places in the South.

For the good of the South we wish these facts could be placed before every intelligent man and woman in the rest of the country. And yet, there is one objection to that: If it could be done the rush of population South would be so great as to swamp every railroad, overcrowd every Southern hotel, double the value of Southern property and temporarily seriously disturb the business interests of all other sections. If the railroads of the South were willing to be thus overcrowded, if they were willing to see such activity as was never witnessed before in America, if the people of the South really wanted all these things and were willing to work for them as vigorously as do the people of the Pacific Coast, then these possibilities would soon become realities.

But to come back to this issue, with its many brilliant articles! How do you like it?

VIRGINIA.

Hon. Wm. Hodges Mann, Governor-elect of Virginia, has, in the interest of the material development of the Commonwealth, kindly called the attention of the MANUFACTURERS' RECORD to the following comparative statement, made in the last annual report of Commissioner Koiner of the Department of Agriculture and Immigration, of production in Virginia in 1900 and 1908:

	1900 acreage, 4,040,339	1908 acreage, 3,301,500
Corn	$10,300,000	$30,000,000
Wheat	6,200,000	8,000,000
Oats	1,104,000	1,500,000
Hay	7,670,000	10,000,000
Tobacco	7,210,000	8,000,000
Potatoes	2,500,000	3,200,000
Peanuts	2,261,000	2,500,000
All trucks	5,000,000	12,500,000
Orchard fruit	2,662,000	5,000,000
Dairy products	1,900,000	7,000,000
Live stock	42,027,000	70,000,000
Forest products	3,800,000	10,000,000
Miscellaneous crops.	470,000	1,300,000
Mineral output	30,000,000	35,000,000
	$129,104,000	$204,000,000

These figures show that in spite of a lessening by 740,000 acres of the area cultivated in 1908, the value of crops increased from $95,304,000 to $159,000,000 between 1900 and 1908, and that there was an expansion in the value of forest products from $3,800,000 to $10,000,000. The improvement in agricultural conditions was all along the line. But the most notable increases were in corn, from $10,300,000 to $30,000,000; in hay, from $7,670,000 to $10,000,000; in dairy products, from $1,900,000 to $7,000,000; in live-stock, from $42,027,000 to $70,000,000; in orchard fruits, from $2,662,000 to $5,000,000, and in trucking, from $5,000,000 to $12,500,000.

These increases are fair indications of the trend that farming in Virginia has taken. In 1900, of the total 25,767,680 acres of land in the State, 19,907,883 acres were in farms, and of the farmlands, 10,094,805 acres were improved. Among the other farmlands were part of the 14,000,000 acres of forest land of the present time. This forest land, much of it in the mountain country, where extensive farming can never be, must be considered in any calculations of the future of Virginia agriculture. It would, indeed, be well if the State may continue to have indefinitely one-half of its area in woodland, representing orchards and lumber resources. Part of the Southern Appalachian Forest Reserve should be in the State. The remaining 13,000,000 acres will suffice, if handled according to the best methods, to give Virginian agricultural income annually on one side or the other of $500,000,000.

The Old Dominion is to be congratulated that the aggressive and progressive policy of the administration of Governor Swanson for the material advancement of its people is to be maintained by Governor Mann.

THROWING OFF INDUSTRIAL DEPRESSION.

Decline in the value of mineral production in the country from $2,069,289,196 in 1907 to $1,595,670,186 in 1908 was a striking reflection of the financial disturbances of the winter of 1907-08. Gains already noted for leading minerals in 1909 over 1908 point to the escape of the country from the depression of a year or 18 months, and promise greater activity in 1910. Experts of the United States Geological Survey estimate that the output of iron ore last year was 51,000,000 tons, 700,000 tons less than in 1907, but more than 15,000,000 tons greater than in 1908, and that the production of pig iron was 25,500,000 tons, about 280,000 tons less than in 1907, but 9,500,000 tons more than in 1908. Coal mining has had similar developments, the output in 1909 amounting to 450,000,000 tons, being 30,000,000 tons less than in 1907, but 45,000,000 tons more than in 1908. The interesting features of the coal exhibit is that the Alabama production will show an increase of from 15 to 20 per cent. over 1908, and that the production in three other Southern States—Maryland, Virginia and West Virginia—has about equaled that of 1907, and that, too, in the face of a shortage of labor and some shortage of cars in West Virginia. A factor in this group of States was the completion of the Virginian Railway, furnishing an additional outlet for the coals of the Kanawha, New River and Pocahontas fields. In the few months of its operation it carried nearly 1,500,000 tons to the seaboard, and it is expected that within a couple of years it will transport 5,000,000 tons. The completion to Spartanburg, S. C., of the Carolina, Clinchfield & Ohio Railroad has already meant an increase of 25 per cent. in the production of coal in Lee County, Virginia. In that region a number of other transportation facilities are contemplated, and such constructions into the coal fields of Southern West Virginia, Southwestern Virginia and Eastern Kentucky have been notable features of railroad activities for two or three years past.

Expanding use of oil and gas has affected coal production in parts of Illinois, Indiana, Western Kentucky, Iowa, Kansas and Missouri. Still, there was a decrease of between 6,000,000 and 2,000,000 barrels in the production of petroleum, according to different estimates, in which West Virginia, the leading Southern producer, did not share, and the decline in Southern Louisiana being offset by an advance in the Caddo field, due to the starting of work on the Standard Oil refinery at Baton Rouge, and on the pipe line connecting it with the Caddo field.

Copper has surpassed all records by more than 200,000,000 pounds, and lead has gone beyond 1907, with zinc slightly below that year, but 30,000 tons greater than in 1908.

These figures are, as it were, mere outlines of the improvement in the mineral outlook of the country, but they indicate a betterment in industries largely dependent upon mineral production.

WOMEN READERS.

The MANUFACTURERS' RECORD is always particularly gratified in having the judgment of a woman passed upon it. Such judgment is a sign that the woman has read the MANUFACTURERS' RECORD, and the more women readers in the South of the MANUFACTURERS' RECORD there are, the better it is for the South. A case in point is the following, from Mrs. A. O. Brigance of Navasota, Texas:

I have received the *Daily Bulletins* with my inquiry. From it I am hearing from the reinforcing people. Thank you very much for your successful way of doing things. I find so much valuable information in the MANUFACTURERS' RECORD and think every inventor should take it, as it puts folks right in touch with the best manufacturing people.

SPECIAL FEATURES IN THIS ISSUE OF THE MANUFACTURERS' RECORD.

DR. DAVID T. DAY, UNITED STATES GEOLOGICAL SURVEY:
"The Development of Southern Mineral Industries."

CLARK HOWELL, EDITOR OF THE ATLANTA *Constitution:*
"The South: The Nation's Greatest Asset."

HON. JOSEPH E. RANSDELL, CONGRESSMAN FROM LOUISIANA:
"National Rivers and Harbors Congress."

BERNARD N. BAKER OF BALTIMORE:
"Vast Shipping Possibilities of the South."

WADE H. HARRIS, EDITOR CHARLOTTE *Evening Chronicle:*
"Southern Hydro-Electric Power Development."

EDWARD WHEELER PARKER, UNITED STATES GEOLOGICAL SURVEY:
"The Coal Fields of the Southern States."

DR. JOSEPH HYDE PRATT, NORTH CAROLINA STATE GEOLOGIST:
"The Public Road Situation in the South."

PRESIDENT ANDREW M. SOULE, GEORGIA COLLEGE OF AGRICULTURE:
"Commercial Importance of Cottonseed."

HON. G. W. KOINER, VIRGINIA COMMISSIONER OF AGRICULTURE:
"The Greatest Need in the South Today."

ERNEST F. BURCHARD, UNITED STATES GEOLOGICAL SURVEY:
"Clays and Building Stones of the South."

COL. ALFRED B. SHEPPERSON OF NEW YORK:
"A Review of the Cotton Situation."

COL. ROBERT J. LOWRY, PRESIDENT LOWRY NATIONAL BANK, ATLANTA:
"The Coming Financial Strength of the South."

D. A. TOMPKINS OF CHARLOTTE, N. C.:
"Substantial Permanent Basis of Southern Progress."

Y. A. DYER OF BIRMINGHAM:
"Iron and Steel and Kindred Interests of Alabama."

ALBERT PHENIS, NEW ORLEANS:
"Sweep of Commerce Toward Gulf Ports."

CHARLES CATLETT OF STAUNTON, VA.:
"Railroads and Their Changing Relations to the Public and to Each Other."

SAMUEL G. WILMER OF BALTIMORE:
"Railroad Work South and Southwest."

JOHN WOOD, SECRETARY GREENVILLE (S. C.) BOARD OF TRADE:
"Social Effects of the Cotton Industry."

WILLIS B. POWELL, SECRETARY TAMPA (FLA.) BOARD OF TRADE:
"Immensity of Tampa's Cigar Industry."

M. V. RICHARDS, SOUTHERN RAILWAY:
"Movement of Homeseekers to the Southeast."

DR. CHARLES N. GOULD, OKLAHOMA STATE GEOLOGIST:
"Conditions in Oklahoma."

PAUL T. BRADY OF NEW YORK:
"To Induce Capital and Immigration to the South."

J. W. BILLINGSLEY, C.E., OF NEW ORLEANS:
"Interurban Railway Development in the South."

C. B. SCHMIDT, ROCK ISLAND-FRISCO SYSTEM:
"Rock Island-Frisco Development Work."

J. H. REESE OF MIAMI:
"Citrus Fruit Industry of Florida."

J. W. WHITE, SEABOARD AIR LINE RAILWAY:
"Unprecedented Demand for Farms and Homes."

A. C. VANDEVER OF BALTIMORE:
"$15,000,000 for Southern Church Building."

J. C. DIONNE, EDITOR *Southern Industrial and Lumber Review:*
"Lumber and General Conditions in the Southwest."

EDWARD WISNER OF NEW ORLEANS:
"Louisiana Swamp Land Reclamation."

WILLIAM C. CLOYD OF RUSK, TEX.:
"Basic Elements in Texas Progress."

CAPT. J. F. MERRY, ILLINOIS CENTRAL RAILROAD:
"Settling Up the South."

W. W. DUSON OF CROWLEY, LA.:
"Louisiana's Material Gain Through Rice Culture."

WILLIAM H. STONE OF BALTIMORE:
"Typical Building in the South in 1909."

R. H. HUNT OF CHATTANOOGA, TENN.:
"Church Building in the South."

WILLIAM B. PHILLIPS OF THE UNIVERSITY OF TEXAS:
"Geological Surveys and the Public."

HERBERT C. CALDWELL OF BALTIMORE:
"Great Activity in Southern Textiles in 1909."

POSTAL REFORM.

Sound sense in dealing with the question of postal reform and bringing out points overlooked by President Taft in his message is set forth in the following by *The American Review of Reviews:*

A recommendation that shows lack of full study advises the increase of postal rates on newspapers, magazines and periodicals. For a long time second-class matter has been carried at 1 cent a pound. If this is less than it costs the Government to transport and distribute newspapers and periodicals, it does not necessarily follow that the rate ought to be raised. Within the memory of middle-aged persons postage on newspapers and periodicals was paid by the subscribers at their local postoffices. The change of law requiring advance payment at pound rates by the publishers shifted the burden from the subscribers and was a convenient reform. It is true that printed matter constitutes the large part of the mail carried by the Government. But the periodicals do more to nationalize literature and public opinion than any other one thing. Furthermore, very much of the profitable business of the Postoffice Department grows directly out of the publicity created by newspapers and magazines. Even the direct transactions with the postoffice of a publisher are profitable to the Government, inasmuch as the purchases of postage stamps for the carrying on of correspondence with subscribers, and the other postal business of such an establishment give the Government far more profit than its handling of the magazines at the rate of 1 cent per pound can cause it loss.

Mr. Taft is of opinion that the magazines carry more advertising in proportion to reading matter than the newspapers. This, as it happens, is an entire mistake. But the suggestion gives opportunity to explain that of all the business done by the Postoffice Department the most profitable is the carrying of advertising. Rather than force magazine advertising out of the mails, the Government could better afford to carry it for nothing. The chief object of the reputable business people who patronize the advertising pages of the periodicals is to provoke correspondence. A single advertisement on one page of a periodical has brought to the advertiser 17,000 letters. Each one of these letters starts a return patronage of the mails. The actual carrying of that advertisement has cost the Government an infinitesimal sum. The return received by the Government has been the large profit upon the sale of many thousands of 2-cent stamps. It is impossible properly to consider the rate of postage to be charged by the Government on one class of matter without studying the relation of the rates on different classes to one another. Mr. Taft is actuated by a commendable desire to lighten the burdens of the Government and to introduce economies. But as a matter of fact the carrying of newspapers and periodicals is not a burden to the Postoffice Department and it is a great boon to the intelligent public of America.

It should be borne in mind that what he calls the deficit in the Postoffice Department is not real. The Postoffice Department is earning a large surplus profit on the business it carries on for its patrons. Even if all publishers and private individuals and firms withdrew their business from the Postoffice Department, the Government would still have its own large distribution of letters and printed material to make for Congress, for the departments at Washington, and for the official business of several hundred thousand people constituting the civil and military services of the United States. It would probably have to pay from seventy-five to a hundred million dollars a year to carry on its own postal business. Yet the books of the Postoffice Department do not make any account whatsoever of this vast item. It is safe to say that there is no other government in the world whose postal department is not credited with the expense it incurs for handling the business of the other departments. It is a scandal and a public disgraces that business should be done so loosely at Washington that no postoffice records are allowed to show what it actually costs to distribute the speeches of Congressmen, the documents sent out from the Agricultural and other departments, and the millions of letters relating to Government business. It is just as much a matter of Government expense to transport official documents as to transport troops. The War Department makes record of the cost of transporting troops, but no reports of the Postoffice Department indicate the cost of carrying the Government's own materials.

Furthermore, the enormous extension of free rural delivery has added a burden of many millions of dollars to the Postoffice Department without bringing immediate financial returns. Congress ought to have made some direct appropriation for this service. Even if the free rural carriers could be permitted to deliver small parcels for the benefit of the people on their routes, this valuable extension of the service could soon be made almost self-supporting. It is not uninteresting to note the fact that certain express companies and other private interests are always lobbying at Washington to prevent the passage of such measures as a parcel post for the convenience of the people. And the public may just as well be informed of the fact that these same interests have been busily at work for some years trying to secure an advance in the postal rates on periodicals and newspapers. It only needs statement to make it clear that if magazines and newspapers were thrown out of the mails by prohibitive postal rates certain news companies and express companies might hope to play a larger part in the distribution of such periodicals. The subject is one that Mr. Taft has not taken up as yet at first hand, and in the multiplicity of great topics that have been crowding upon his attention in the opening weeks of his term it is, perhaps, not strange that he should have been misled in a few matters.

There is more need in the Postoffice Department of a careful reorganization than in any other branch of the Government. Mr. Tafts' idea of driving a wedge between the newspapers and the periodicals of more general circulation seems wrong in principle and is based upon a misunderstanding of the facts. Free delivery within the county is already a great discrimination in favor of newspapers. Furthermore, the cost of handling each individual piece is a more important item than the cost of transportation by the pound. Thus it costs the Government a great deal more to handle a pound of newspapers, consisting of a number of separate papers to be distributed to different people, than to carry a single magazine weighing a pound to one subscriber. Yet Mr. Taft, through misapprehension, states the matter in exactly the opposite way. The magazines are chief producers of the lucrative business of the postoffice. Even without revision of the very favorable contracts with the railroads for carrying the mail, and without the other economies that could be brought about by a better business organization of the postal service, there is so large a profit collected by the Government upon all the business that the postoffice does for private patrons, including the newspapers and periodicals, that this surplus practically pays the Government's own great bill for carrying and distributing its own mail matter. The magazines and periodicals of this country confessedly surpass in merit those of any other part of the world. Their merit is due to their patronage by a great and intelligent nation spread from the Atlantic to the Pacific. A hostile postal policy such as Mr. Taft proposes would have made impossible the development of such valuable and beautiful expressions of our life as are typified, for example, by the *Century Magazine*. Let the Postoffice Department set its own house in order, give us a balance-sheet of its real transactions, as the other departments of the Government do, rid itself of its harmful and extravagant relations to politics and party spoils, and bring a permanent business head to the conduct of its large affairs. Then, if necessary to deal with such delicate questions as radical changes in rates, there will be time enough to discuss them on their merits.

THE SOUTH CONGRATULATED.

Mr. Frank D. La Lanne of Philadelphia, president National Board of Trade, writes to the MANUFACTURERS' RECORD:

You know my sincere interest in public matters and my great faith in the growing empire of the South. I am delighted to see the statement which you make, and that the South is becoming the great manufacturing and coal-producing part of our country. What with building the cotton mills in the cotton fields, and making a product at the least possible cost, and with your great possibilities for the production of minerals and grain, it seems to me that the South, because of its additional advantage of good climate, must be in the next few years the most prosperous of all parts of our country. I congratulate you very sincerely.

1860——THE SOUTH——1910

In 1860 the South produced, according to careful estimates, to the value of $600,000,000 in agriculture, of $240,000,000 in manufacturing and of less than $10,000,000 in mining.

In 1910 the South is producing to the value of $2,770,000,000 in manufacturing, of $2,550,000,000 in agriculture and of $358,000,000 in mining.

Between the two dates Southern productivity has increased by $4,830,000,000, or by 568 per cent.

Has the record of the people of the South been matched by that of the people of any equal area on the globe during the past 50 years?

For answer the mind need not range beyond the limits of the United States, the twentieth-century leader in world-progress. But the bases of the measure of advance may hardly be either the South of 1860 and the South of 1910 or the South of 1910 and the United States of 1910. The marvel of modern history unfolds as one reads through and around the figures of the accompanying table in which the South of today is placed between the South and the United States of half a century ago.

What was the South in 1860? What had the South done? It was raising practically all the cotton of the country—4,158,000 bales—the material for one of the most widely ramified manufacturing industries of the time, the contributor of more than 50 per cent. of the value of merchandise exported annually from this country, the basis of a market in the lower Mississippi Valley for the grain and bacon of the upper Mississippi Valley States, the main reason for the persistence into the nineteenth century and the enlargement of the institution of slavery in the South. But cotton-growing, upon which so much of the industry, trade and commerce of the rest of the country depended, was by no means the exclusive or even the dominant occupation of the population of the South, constituting but 35 per cent. of the population of the United States. The staple represented in 1860 less than one-third of the value of Southern agricultural products. They included 431,500,000 bushels, or 37 per cent. of the total 1,175,000,000 bushels, of the three leading grains raised in the country; all of the cane sugar, all the rice save a few hundred bushels of the total 4,158,000 bushels, and 351,500,000 pounds, or nearly 82 per cent. of the tobacco. The country grew 110,571,000 bushels of Irish potatoes. The South, raising 95 per cent. of the sweet potatoes, paid but slight attention to the other kind, and was credited with but 8.6 per cent. of the total. So, too, where hay was needed it preferred to buy most of it. Meantime it had begun to send early fruits and vegetables to Northern markets, opening the lines for an income aggregating now more than $100,000,000 a year.

Cotton-growing and other farming absorbed for 50 years after 1800 much of the capital of mind, muscle and money that elsewhere went into manufacturing, and diverted for a while the industrial energy of the South. But the impetus given to cotton-mill building in the later forties was reflected in the exhibit of 1860 of $142,368,237 invested in manufacturing, yielding $240,309,780; of 120,761 tons of pig-iron made, of $20,936,783 worth of sawn and planed lumber, of 1,374,720 tons of coal and of 229,237 tons of iron ore mined. Of the total Southern capital in manufacturing $12,139,721 was in textiles, about one-eighth of the total investment in that line in the country, and the 352,946 Southern spindles used 58,960,746 pounds of cotton. Self-content of plantation life accounted for $16,585,000 worth of home-made goods, two-thirds of the total in the country.

Because of the importance of cotton in foreign commerce, products of the South constituted more than 50 per cent. of the total exports, and, barring specie, more than half the exports moved from Southern ports. New Orleans ranked second to New York in export trade.

Sending from the port of Savannah in 1819 the first steamship to cross the Atlantic, and pioneering in the construction of railroads to bring the interior into quick touch with the seaboard, the South naturally led as a commerce-producer and a commerce-handler. Between 1850 and 1860 it showed forth its real spirit, not only in adding rapidly to its industrial equipment, but also in extending its railroads. Its 9897 miles of railroad in 1860 was an increase of 7561 miles, or 323 per cent., in 10 years, while the 20,897 miles in the rest of the country was an increase of 14,693, or only 240 per cent.

This speed was a manifestation of the revival of impulses partly dormant for 50 years, but never permitted to be absolutely lost. For far-seeing and informed men, such as Robert Y. Hayne, John C. Calhoun, Matthew F. Maury, Ambrose D. Mann, Ballard Preston, James D. B. De Bow, William N. Burwell, J. G. Gamble, William Gregg, John Forsyth, George McDuffie and Daniel Pratt, preached or practiced Southern material development whenever opportunity presented itself. They embodied in speeches or papers visions of a greater South and a greater country that have just begun to be realized. They labored for transportation lines connecting the Atlantic and the Pacific across the continent, and New England with the Gulf States by way of Washington; for a piercing of the Latin American isthmus, giving this country access to markets of the Pacific; for a combination of rail lines and steamships in quick travel from the heart of America, the Mississippi Valley, and England and the Continent of Europe; for rapid sailings between our ports and those of the eastern coast of South America and the rich valley of the Amazon.

The South by 1860 had given the world anesthesia, through Dr. Crawford Long; the revolutionizing harvesting machine, through Cyrus H. McCormick; perhaps the first chair of economics in an educational institution, through Maunsel White of New Orleans, with another institution conferring the honorary degree of master of arts in recognition of a man's services to the State as a leader in industry, and the charting of the seas, through Matthew F. Maury, the leading scientist of his day. The caring particularly for its own material interests had begun with the completion of many of its tasks for the country as a whole. They had been stupendous in their doing and in their effects. Their end is not yet.

While the young States, not yet established in a more perfect Union, were making good under the leadership of the great Southerner, Washington, their stand for independence that was to affect the whole theory of government of man by men, George Rogers Clark assured to the United States, then embracing 750,000 square miles of land, an additional 250,000 square miles in the Northwest Territory and control of the country between the St. Lawrence and the Gulf and the Atlantic and the Mississippi. Ohio, Indiana, Illinois, Wisconsin, Michigan and a part of Minnesota have risen as his monument. About 920,000 more square miles of territory were gained in the Louisiana purchase of 1803, the piece of practical statesmanship by the political philosopher, Jefferson, preventing disruption of the Union and making sure the permanency of English institutions on the North American Continent. Under his auspices, too, William Clark and Meriwether Lewis, adventurers of peace, determined that the 245,000 square miles of Oregon, Washington and Idaho should belong to the United States. Under James Monroe, whose name is identified with a distinctively American doctrine, 75,000 miles were added in the Florida purchase of 1819. Southerners, against the protests of some parts of the country, were responsible for the accession of the 200,000 square miles of Texas and the 687,000 square miles embracing the present Arizona, New Mexico, Utah, Colorado, Nevada and California. Within seven years of 1860 the last addition to the territory of the United States from contiguous lands had been made in the Gadsden purchase. All additions, aggregating 2,400,000 square miles, were the fruits of Southern valor or Southern wisdom, and between the time of the adoption of the Constitution in 1789 and the subversion of it in 1861 nine of the 15 Presidents of the United States were men of Southern birth, and they had served in 42 of the 72 years.

Statesmanship of a less dramatic form, dealing not with questions of territorial expansion, but with the conquest of nature to man's welfare, had all along been exercised in handling millions of negroes, thousands of them fresh from the jungles of Africa and more of them but one generation removed from absolute barbarism, so wisely and so efficiently that in 1860 nearly 4,000,000 of them were better equipped for valuable service to themselves and to others than any negroes have since been equipped. That was one of the greatest educational tasks that has ever been accomplished. It benefited the South, in some respects, for the moment, but it benefited the negro much more. It was a clog upon Southern ultimate progress, however it may have aided temporarily the country's growth.

It was a task imposed upon the South from without, but was not unmixed with self-interest. The other tasks of Southern statesmanship looked primarily to the good and the greatness of the United States. Had the South held government to be a means of gaining material ends instead of an opportunity to develop political ideals its control of public affairs during the greater portion of the period of the Constitution up to 1860 would have placed it in a stronger position for its wonderful defense of a principle of government in a four-years' war.

Staking all in that expression of a conviction and defeated, the South was for 15 years the submerged section, the victim of a history-making that is

FIFTY YEARS OF SOUTHERN PROGRESS.

	The South		United States.
	1860.	1910.	1860.
Population	11,021,146	28,085,000	31,443,322
Density	13.6	34.7	10.5
Manufactures—			
Capital	$142,368,237	$2,214,000,000	$1,000,855,715
Products	$240,609,780	$2,777,000,000	$1,885,861,676
Cotton Mills—			
Capital	$12,139,721	$298,900,000	$98,585,269
Spindles, active	352,946	11,335,000	5,235,727
Looms, active	8,542	244,000	126,313
Cotton used, pounds	58,960,746	1,310,000,000	422,704,975
Pig-iron made, tons	120,761	3,800,000	987,559
Lumber, value	$20,936,783	$440,000,000	$95,912,286
*†Agricultural Products, value	$600,000,000	$2,550,000,000	$1,750,000,000
*Cotton Crop, grown—			
Bales, 500 lbs	4,157,470	10,000,000	4,158,461
Value, without seed	$182,928,680	$750,000,000	$182,972,284
*Grain Products, bushels—			
Corn	358,154,000	735,829,000	830,452,000
Wheat	44,865,000	60,781,000	171,183,000
Oats	28,497,000	50,409,000	172,555,000
Coal mined, tons	1,374,720	113,600,000	14,610,042
Iron ore mined, tons	229,237	7,000,000	2,514,282
Railroad mileage	9,897	69,400	30,794
‡Exports, value	†$188,000,000	$650,000,000	$373,000,000
Banks—			
Deposits	$61,741,183	$1,386,000,000	$253,802,129
Common Schools—			
Expenditures	$4,474,370	$56,000,000	$22,548,519
Property, true value	$6,286,214,108	$21,500,000,000	$16,159,616,068

*Year preceding census year. The Southern cotton crop does not include cotton grown in Missouri, Oklahoma or other States outside the South.
†Estimated. ‡1860 included specie.

America's shame. But there was advantage for its future in its lying fallow for a season while the rest of the country went through the experiments consequent upon the rapid unfolding of a new industrialism and the application to material things of the lessons learned in the mass features of warfare. Moreover, the natural resources of the South were unaffected by political developments of the time. Between 200,000,000 and 300,000,000 of forest land was becoming more and more valuable every year. More than 494,000,000,000 tons of coal, or one thousand times the amount now mined annually in the whole country; 10,000,000,000 tons of iron ore, uncounted supplies of petroleum and natural gas, unthought of beds of phosphate rock and masses of other metallic and non-metallic minerals waited. Only a comparatively infinitesimal quantity of magnificent water-powers had been developed. Many thousand acres had been run down in cotton-cropping, an unavoidable necessity in the years of stress, but nearly 60,000,000 acres of the richest sort of alluvial soil could be depended upon to meet, through simple reclamation, any land emergency that might arise.

Even while the generation that was to the fore in 1860 was still vigorous and daring in projects for utilization of these resources, the South emerged from its disaster, the same South essentially as ever, with its special problems still onerous, though modified, with its vast wealth forces in field, forest and mine. Southern initiative and pluck putting forth its small capital quickly attracted men and money from other quarters into the partnership for Southern progress, led by Southern men, those born since 1860 yielding nothing of enterprise and vigor in material undertakings to their fathers or their fathers' fathers.

Therefore, the South has made good. In 30 years its dreams of 50 years ago have become actualities. The 1910 inventory will, according to conservative estimates, based upon the best that the South has already done, show notable positive results.

In 1860 the South was more densely populated than the rest of the country. That status is unchanged. But the average of 34.7 persons to the square mile shrinks to very small dimensions when one considers that the population of Massachusetts is ten times as dense, and that the density of individual Southern States themselves ranges from 135 in Maryland, where more than 40 per cent. of the population is massed in the 30-odd square miles of Baltimore city and 60.5 in Kentucky, to 14.6 in Texas and 12.4 in Florida. Migration of 2,500,000 of its natives to other parts of the country since 1860 more than accounts for the failure of the South to have now a population equal to that of the country in 1860. Ever since the bringing of negroes into the South ceased that section has had to depend principally upon births within its own borders for the increase in its population. In 1860 the South had but 383,482 of the total 4,136,275 foreign-born in this country. The proportion was even less 40 years later—539,337 in a total of 10,341,276—and of the total number of aliens—782,870—admitted to the country in 1908 the South received only 40,765. Considering the class of immigrants that have come to America in the past 10 or 15 years, the South has been rather fortunate in missing so many hundreds of thousands of them. They could have but spoiled the South of the future, whatever some of them may have been able to accomplish in the rough work of the moment. Their neglect of the South makes that section the more attractive to desirable men and women, American-born or of foreign origin, who would escape from the suffocation consequent upon the herding of the undesirables and unassimilables in other parts of the country.

In spite of the shortage of population, however, the South has passed rapidly along the road to prosperity. Its property was worth $6,300,000,000 in 1860. To that it has added $15,000,000,000, in spite of the $2,000,000,000 or $3,000,000,000 lost as a consequence of war, and now is worth $5,000,000,000 more than the whole country was 50 years ago. Largely contributory to the increase has been the advance in land values coincident with the change for the better in the price of cotton since the beginning of this century. In the six cotton years 1894-1895 to 1899-1900 the aggregate value of the cotton crops, including the seed, was $2,235,000,000. In the next six years the value rose to $3,669,000,000, an increase of $1,434,000,000, or an average increase of $239,000,000 a year. The combined value of the crops of 1906-1907 to 1907-1909 was $2,333,000,000, while the value of the crop now being marketed, including seed, will hardly be less than $900,000,000, or $300,000,000 greater than the value of all farm products in the South in 1860 and more than half the value of the country's agricultural output in that year, and the value of this year's cotton crop is but 35 per cent. of the value of the South's total agricultural output in 1909, and the South's total 1909 agricultural production is worth $800,000,000 more than the country's agricultural production 50 years ago.

In the half-century the South's manufacturing capital has increased from $142,368,000 to $2,214,000,000, or by $2,071,632,000, equal to 1454 per cent., and the value of its manufactured products from $240,610,000 to $2,777,000,000, or by $2,536,390,000, equal to 1541 per cent. Its capital in manufacturing is more than twice as great as that of the country in 1860 and the value of its products nearly $900,000,000 greater.

Though the textile industry was a pioneer in the revival of Southern manufacturing when the pall was lifted, it ranks below lumbering in the value of its products, for nearly 50 per cent. of the lumber cut in this country now is of Southern origin. Still the capital in Southern cotton mills is three times as great as that of the country in 1860, and it has 11,335,000 spindles, against the country's 5,236,000 then; 244,000 looms, against 126,000, and is using more than three times the quantity of raw cotton. Of American cotton the Southern mills consumed during the season 1908-1909 more than all the mills in the rest of the country, not for the first or the second time in recent years. And yet Southern mills are not taking 25 per cent. of the annual cotton crop.

In 1860 seven States—Maryland, Virginia, Georgia, Alabama, Arkansas, Kentucky and Tennessee—mined a total of 1,374,720 tons of coal. Today both Texas and Arkansas are mining each a greater quantity than that Southern total, and West Virginia alone is mining three times the country's 1860 total of 14,610,000 tons, and the South more than eight times as much. Against the country's production in 1860 of 2,514,282 tons of iron ore and 987,557 tons of pig-iron place, too, the South's output today of 7,000,000 tons of iron ore and 3,800,000 tons of pig-iron.

The discovery of the commercial value of petroleum in 1859 started a discussion of its effect upon the price of cottonseed oil. Fifty years have brought the country's production of petroleum from a few barrels to 180,000,000 barrels annually, to which the South contributes 30,000,000, and in the same period the cottonseed industry, confined principally to the South, has grown from almost an experiment to a production of $100,000,000 a year. There is no comparison of the South and the country in that particular or in the case of sulphur, in which Louisiana dominates the world's markets; of phosphate rock, produced chiefly in Florida, South Carolina and Tennessee, and of naval stores—distinctively Southern products. They are among the South's special gifts to American wealth.

Their exploitation has come with the centering in the South of a great fertilizer industry and with the enhancement of the importance of Southern seaports following marked changes upon the railroad map of the country. For Southern ports are now handling twice as much exports as did all ports in 1860, and the value of exports at Galveston—$180,464,335—in the fiscal year ended June 30, 1909, was $62,000,000 greater than the 1860 value of exports from New York.

Once the building of railroads in the South was advocated for the purpose of bettering the facilities for marketing through Southern ports the agricultural products of the South and the West. Now, with the Southern mileage more than double that of the country's 30,794 in 1860, the timber, the coal and the iron ore of the South are main objects in new railroad undertakings, although the export trade is not overlooked in the nearly completed project of crossing the Florida keys by rail and in the plan of connecting through the heart of the coal fields the ports on the Lakes and on the South Atlantic seaboard.

It is not surprising that the many energies thus broadly sketched have added to the South's wealth nearly thirty times, and that one form of that wealth, deposits in banks, now amounting to $1,386,000,000, is more than five times as great as the whole country's in 1860. The South has made money and is making more. It is spending money in further development of natural resources, in State and municipal improvements, in betterments of farm homes and city residences, in educational and religious work. Nearly $30,000,000 are involved in plans for improved highways in the South made definitely in the past year. Another $15,000,000 have been spent, or planned to be spent, upon church buildings since January 1, 1909. More than $50,000,000 a year are the expenditures for common schools, against $4,474,000 in the South and $22,548,000 in the whole country in 1860.

The South is upon a foundation of a $5,500,000,000 annual production, and is more and more appreciating the opportunities and the responsibilities that such a gross income implies.

Gratifying as this exhibit is, it is not entirely as satisfactory as it should be. Southern progress is not yet well balanced in every respect. The situs of unsurpassed agricultural opportunities, capable of raising any crop that may be grown in any other portion of Continental United States, and, in addition, crops that cannot be grown in other parts of the country, the South is not maintaining its farming proportions. There is no reason in soil or in climate why the South should not produce in agriculture to twice the value of its manufacturing output—about the proportion of 1860. But, as in other parts of the country where manufacturing is the salvation of the population, the South's factories have surpassed its farms in wealth production.

It is not doing as well in grain-growing as it did in 1860. Fifty years ago the South raised 32.5 bushels of corn and 4.07 bushels of wheat, and the rest of the country raised 23.1 bushels of corn and 6.13 bushels of wheat, to each one of the population. In 1909 the South raised but 26.8 bushels of corn and 2.1 bushels of wheat to each of its population, while the rest of the country raised an average of 33.1 bushels of corn and 10.8 bushels of wheat to each of its population. To be sure, it was a bad year for grain in the South, the wheat crop being nearly 33,000,000 bushels short of the crop of 1900, for instance. Then, too, the 24,000,000 bushels of Southern rice must be taken into account. The fact remains, though, that more grain should be raised in the South, as the accompanying exhibit in Southern farming indicates.

AN EXHIBIT IN SOUTHERN FARMING.

	The South.		United States.
	1859	1909.	1859.
Cotton, bales, 500 pounds	4,157,470	10,000,000	4,158,461
Corn, bushels	358,154,000	735,829,000	830,452,000
Wheat, bushels	44,865,000	60,781,000	171,183,000
Oats, bushels	28,497,000	50,409,000	172,555,000
Rice, bushels	4,158,300	24,368,000	4,158,600
Tobacco, pounds	351,500,000	696,118,000	429,400,000
Hay, tons	1,419,000	4,604,000	19,129,000
Irish potatoes, bushels	9,602,000	29,881,000	110,571,000

In manufacturing expansion in textiles too often means a shortage of workers in the cotton fields, and *vice versa;* the iron trade has not fulfilled the early promise of the 1880-1890 decade, and the lumber camp and railroad camp are in rivalry now and then, to the hampering of both.

It is obvious that the South is not yet sufficiently manned for its great material tasks. It has not enough human power to handle all its big jobs at the same time. Men attracted to one line mean men drawn from other lines just as important. But invention is steadily reducing the amount of human muscle power needed in great operations. The swelling of the tide of desirable immigrants to the South on agriculture bent is bound to be followed by a flow of workers in other fields. The faith that saw in 1860 what the South could do and that sustained it in the time up to 1880 when it was barred from its own opportunities is the faith of the South in 1910. It is a faith that has already removed mountains. It can likewise overcome the minor difficulties of detail that now embarrass and annoy.

But it can triumph finally and truly only if the South forget not the landmarks of the fathers, only if the South keep before it the ancient law that principle is greater than profit, and that all the material wealth in the world is worthless if in the winning of it be sacrificed the fundamentals of character that make a people, as an individual, really great and which cannot be measured by money.

THE DEVELOPMENT OF SOUTHERN MINERAL INDUSTRIES

By Dr. David T. Day of the United States Geological Survey.*
[Written for the Manufacturers' Record.]

Specialization in the production and utilization of mineral products was never so marked as at present. Further, it is not probable that this specialization will ever again be so characteristic of industrial conditions. For example, the coal miner or the oil-well driller attends solely to his own product and looks entirely to another specialist for the drills and implements of his own specialty.

It is equally true and equally significant that interdependence between the industries becomes more marked every year. Each specialist draws his contributory material in the most finished condition possible from a greater and greater number of other specialists.

An equally clear sign of the times is the general fact that so soon as two or more concerns have so specialized as to produce merchandise that is commercially identical in its character and destined for the same trade so soon are these two or more concerns merged into a single company. If the combined capacity of the merged plants exceeds the surrounding market, then one must be closed until one market is supplied with one specialty by one specialist. Such a program of industrial consolidation and the merging of the individual concern until one company fills the place of many gives, at first glance, a pessimistic outlook for the addition of new small manufacturing plants anywhere. But this view is short-sighted, for, with this consolidation of industries is the integration referred to above. The plants which have decreased by consolidation have a chance to increase again by the tendency of each concern to limit itself sharply to few products, and thus the number of concerns must increase to supply the constantly growing number of kinds of products.

These considerations apply to each individual market. The extent of territory served (rationally or not) by a single center of production is determined by the low cost of production at the center and by transportation rates to distant markets. Frequently the central producer has reached out by means of shrewd trading to unreasonably distant points and has temporarily succeeded by tricks of trade in discouraging the faith of the consumer in the possibility of developing cheaper supplies at home. Thus the cost of freight on a ton of pig-iron or of steel shipped from Scotland or from Chicago to the Pacific Coast equals the entire estimated cost of production in San Francisco or Portland. But California did not chance to be peopled by ironmasters, as was Eastern Pennsylvania. Had the iron men of Pottstown, Reading, Johnstown and Lehigh Valley been blinded by gold and by mammoth agricultural products, as were the "Argonauts" of California, we would still draw our pig-iron and steel from England, and the iron-ore mines of Cornwall, Pa., would still lie dormant, as do the magnetic sands within seventy-five miles of the Union Iron Works at San Francisco. It has been easy for the Eastern ironmaster to blind the eyes of the Western industrialists by pointing to the paucity of coal on the Pacific Coast and to keep them from adapting their unusually cheap electric power to this use, even after electrically-made steel is an established product in Indiana, where coke is cheap and electricity dear in comparison.

But these strained trade methods are the temporary contradictions of natural law, and therefore, where the transportation burden is greatest, there will come the quickest extension of local industrial development into each consuming center. As a well-known example: The center of marble production for the United States is Proctor, Vt.; but the freight burden on this heavy commodity made it necessary to relieve the long haul to the Southern markets by taking into the scheme the quarries at Knoxville, Tenn., and in Georgia.

When any country like Germany, for instance, has in the course of long civilization developed an industrial system that supplies all the varied needs of its people, further development may only be expected in the direction of more careful consolidation and spcialization. But in the earlier stages there is ample opportunity for the local people to become skilled in the productive industries for which they are naturally supplied with raw materials, and then to fortify themselves against the encroachment of older and more remote traders by the natural bulwark of costly freight rates. If this is not done, then the inevitable result is the establishment of such industries for them as branches of some distant parent concern. In either case must come steady and profitable employment of the labor most suited to the region—those who are acclimated—the home labor—a consideration ultimately far more important than that of who shall take the profit of the invested capital.

The effort is made below to point out many industries which can flourish in the South by virtue of the distance of the local raw material from competitive centers.

No more important example among present conditions can be cited that the great oil refinery which the Standard Oil Company has begun to erect at Baton Rouge, La. This corporation works in accordance with the laws of trade more relentlessly—with greater precision—than most other business organizations of the world. It absolutely has no center of production. The refinery locations are simply and solely the expression of present trade conditions. Sentiment has not been able even to keep up the prestige of the plant at Cleveland, and the refinery there, on the site of the original still, is now no more than a caterer to local trade, while the important developments have moved east, west, and now south. The refinery at Baton Rouge is the resultant of the trade forces of shipping facilities and convenient access to the necessary crude oil of the Caddo field and the great background of supply in Oklahoma, with possibilties in Arkansas and New Mexico. The sulphur of Louisiana can supply the sulphuric acid needed for refining, and the consumption of soda in the refinery will furnish a tempting market for the utilization of Louisiana salt. No concern on earth has so mastered the burden of transportation cost as this one by its pipe-line developments—and yet none is more observant of the law which places the factory where low freight rates to the consumer will be most effective in the distribution of ultimate products. This great plant at Baton Rouge calls for very special designs. It will be a "special" rather than a general refinery. For, while it will distribute products to the South, East and Southwest, but little attention can be paid to the feature of local sales of anything but illuminating oil. Again, the foreign shipments can well be made from Baton Rouge. But the plant must fore-arrange for very different conditions, if, as is probable, manufacturing is to develop very greatly on the Gulf shores. Then the demand for lubricating oils must be met. Again, the refinery will doubtless be arranged consistently with the present transition stage of fuel consumption. Fuel oil is now burned under boilers, but it is obliged to reckon with the increased use of water-electric power on the one hand and, on the other, the development of internal combustion engines burning fuel oil and other products cheaper than gasoline. Such devices have come to stay and are destined to increase rapidly in their importance in the fuel problem.

Surely the importance of this refinery in Southern industrial progress will be seen at a glance to include a demand for contributory materials, such as staves for wooden barrels, iron barrels, glue, fuller's earth, animal charcoal, sulphuric acid, soda, ammonia for ice machines, tin cans and boxes for special products. Then again sulphur can be had so cheaply that the spent sulphuric acid can well supply a considerable fertilizer factory, and late developments in petroleum technology by Wischin, in Russia, have pointed to new and practical chemical uses for the waste sludge acid of the refinery and the waste alkali liquors as well. But the example of this refinery has served its purpose if it has pointed out the inevitable development of industries where the resources are cheapest and the string of side industries which follow the greater ones.

The conditions for development of the coal trade of the South are treated by Mr. E. W. Parker on another page, and therefore will be omitted here.

What is true in the case of petroleum, cited above, is equally true in other industries. In an article a year ago the chemical possibilties of the Gulf Coast in Louisiana were considered, and these are already becoming strong probabilities. Meantime the effect of the conservation movement and its consequent increased agitation for the Appalachian forest reserve have been of influence in bringing sharply to notice the conditions for the effective development of electricity for power and other purposes in the South. These "other purposes" have really leaped to the front within even a few months. I am thinking particularly of the new conditions developing in iron production due to adapting electric power not only to handling products in steel works, but to the actual electric melting of steel and the manufacture of phenomenally pure iron in the electric furnaces. In a word, steel has lately been produced by the United States Steel Corporation's experiments without manganese, and this steel has proved tough beyond all reasonable expectation. Again, iron almost chemically pure has been produced for sheet-iron. Its quality exceeds any other "wrought" iron. As is well known, metals generally resist oxidation or other chemical attack more effectively in proportion as they approach chemical purity. On this principle this new pure iron, when rolled into sheets, resists oxidation most satisfactorily.

These new experiments point the way to new conditions in the iron industry of the South in which the utilization of water-power must tend to spread the industry to new localities. The electric furnace promises high qualities of steel and iron, gratifying to technologists and profitable to the investor. Some of the electric power from the new dam below Chattanooga can reasonably be expected to supply electric furnaces for refining the iron products of Chattanooga; and Cranberry, N. C., should not be tardy in following the more daring use of the electric furnace for reducing magnetic iron ore. This industry has already commenced in Shasta county, Cal.

This consideration of the electric refining of steel, and eventually the corresponding electric reduction of iron ores, introduces a new element in the question of the availability of iron ores, as set forth very clearly by Dr. C. W. Hayes in his paper on the "Conservation of the Iron Ores of the United States," as follows: "Many iron ore deposits are known in regions so remote from fuel supply and from transportation lines that they may be considered unavailable at present, or so long as they are compelled to compete with more accessible ores. At the same time they must be taken into account in considering the total reserves, for accessibility is only relative, and no deposit if sufficiently large to warrant the expenditure necessary for constructing roads can be regarded as permanently 'inaccessible.'"

Copper and Aluminum.—The development of electric smelting for refining steel, and eventually for reducing Southern iron ores, adds one more demand for copper and aluminum wire for conducting unusually heavy electric loads. The South is already awake to the development of water-power. The uses for the resultant electricity, especially for transportation, are generally appreciated; but there is no rational excuse for delay in applying to the copper of the South the well-understood advantages of electrolytic refining. Butler, the expert on copper statistics, points out, in "Mineral Resources of the United States" for last year, that "in contrast to the smelting industry, which shows a marked tendency to move to the mining centers, the copper refining industry shows a tendency to concentrate on the Atlantic seaboard." This same authority shows that Ducktown, Tenn., was the sixth in rank among the producing regions of the entire United States, producing 19,568,666 pounds of pure copper, every pound of which was shipped away in the form of blister copper and matte. Much of it was made into wire within the Southern States, at Baltimore, but at least $100,000 of freight on the round trip could have been saved had this wire been made at home and used there. The water-powers of the proposed Appalachian forest reserve could probably absorb all this Southern copper if given only reasonable development. Not only would such an industry give profitable employment to many laborers, but the high class of the labor must be considered and its effect in developing mill men in a locality where there is now comparatively little of such skilled employment.

For power transmission copper and aluminum are interchangeable. The use of one or the other depends upon the price, considering the relative carrying capacity for electricity. What has been said for copper is even more obviously true for aluminum, which is the ultimate product of the bauxite mines of Georgia, Alabama and Arkansas. This bauxite production amounted to over 50,000 tons in 1908, according to Phalen, in "Mineral Resources of the United States," and it amounted to 75,000 tons in 1907. More raw material came from Greenland in the form of cryolite, yielding alumina as a byproduct in the production of soda from cryolite; but in so far as do-

*By permission of the Director of the United States Geological Survey.

mestic supplies are concerned, aluminum might well be called a Southern metal. The Southern agency in Atlanta is already disposing of an ecouraging amount of aluminum products consumed in the South, which should be made there.

TIN.—Perhaps the greatest example of the exportation of raw materials to the detriment of industrial growth is found in the deposits of tin ore (cassiterite) on the border between North and South Carolina. Here the work of a few individuals showed that moderate amounts of tin ore could be obtained by placer methods from decomposed pegmatites. In fact, with very cheap labor and crude machinery, a carload of the ore was obtained. An effort was made to find sale for it in the United States, and without success. It was necessary to ship it abroad, to Swansea, to dispose of it. The metallic tin being re-imported into the United States. Every student in chemistry or mineralogy is taught the ease with which tin ore can be reduced as a blowpipe test for the metal. It is not, therefore, the difficulty of tin smelting, but chiefly the ancient trade custom of smelting tin at Swansea which has hampered this small industry. The mines are not rich enough (tin mines seldom are) to admit of this heavy freight haul for the product, neither does the small size of the project admit of a large smelting plant. Nevertheless the natives in Borneo and Sumatra have learned how to smelt tin ores efficiently on a small scale, and a large part of our supply comes from there. From what I have seen of the deposits, it seems probable that the difference in freight costs would be enough to turn failure into success in the South Carolina deposits with a small smelter on the spot. The same problem, on a larger scale, is soon to be settled near El Paso, Tex., where both lode and placer tin deposits are to be developed. It would seem foolish to send a simple problem like tin smelting away from a town built by smelting interests. Once in metallic form, the demand for tin in the South is well developed, especially in the production of tinware in St. Louis.

ZINC AND LEAD.—Nearly all the zinc of the United States is produced in the Southern States and almost all is consumed elsewhere. The most alluring opportunity for home industry in the South is offered by zinc at Bertha, in Southwest Virginia. This zinc is in especial demand in New England for alloying with electrolytic copper for brass manufactures. Labor, fuel and the copper and zinc are cheaper in Roanoke, Knoxville or Chattanooga, but there is no chance of competing with the Connecticut factories so long as designers, die cutters and many other kinds of special skill and special materials are more accessible near New York, to say nothing of the market for products and convenience of selling agencies. But every one of these reasons is an argument for the advantage to the South in the establishment of branches for the manufacture, at first, of the heavier brass products. Eventually the double freight haul on all brass goods should be saved.

The lead products of the Southern States amounted to 126,794 tons, according to Siebenthal, in "Mineral Resources, 1908," and the account of the consumption of this material shows a greater use in the South than is the case with zinc. Much is converted into white lead in St. Louis.

GOLD.—While the product of gold in the Southern States has been small in comparison with the West and has not increased as other products have, gold-mining has been an aid in developing localities poor in fuels and other mineral resources. In fact, lack of efficient fuel for power has discouraged gold mining, but a lesson must now be taken from the dredge industry of California. At Oroville, Butte county, Cal., old tailings are being worked by dredges with electric power from the Sierras. Fifteen cents a cubic yard is there considered rich ground, and 10 cents pays well; in fact, the total cost, including interest on the cost of dredges, is less than 6 cents per cubic yard. At Marysville the dredges are larger and the cost per cubic yard approximates 5 cents. There are many placers richer than this in North and South Carolina and Georgia, and they will serve as a good market for iron products. In fact, many a gold mine would have failed of development had it not been for the enterprise of the Mecklenburg Iron Works, at Charlotte, in furnishing efficient gold-mining and milling machinery at a low freight cost, which is an admirable example of the benefit of home industry.

Another lesson to be learned from the California gold dredges is the utilization of waste rock. Dredging leaves unsightly acres of bowlders piled up by the stacker of the dredge. The land cost the gold dredges perhaps $75 an acre on the average. After they have taken out from 10 to 15 cents per cubic yard, they sell the waste-stone piles at about $100 per acre for crushing for macadam and railroad ballast. Of course, the conditions are very different in California from those in North Carolina. In the former State dredging is carried on in a well-populated country, where crushed stone is needed for concrete buildings designed to withstand earthquake shocks, and much is used on wagon roads, while the dredging ground in the Piedmont Plateau is by no means so well developed. Nevertheless, these water-worn bowlders make the very best crushed stone, which will frequently stand expense of transportation to point of consumption, and this crushed product also makes the finest surface in developing much-needed good roads.

Gold and various precious stones, such as corundum gems, garnet and beryl, should be taken into account as by-products in developing the monazite and zircon industry of North and South Carolina, and certainly these latter minerals should be converted into the rare oxides for which they are useful before they leave the State, though the final purification may be too difficult. Some kind of industrial association should be formed between the gem producers and the mica and talc miners in the effort to realize on all the by-products, including feldspar and quartz, and the manufacture of refractory bricks, etc., from mine waste, as suggested by Pratt, from pyrophylite.

FERTILIZERS.—The last two years have seen the development in Tennessee, which is a good example of the economy effected by co-operation between different interdependent mineral industries. The neighborhood of the Ducktown copper mines has suffered since the opening of the mines, more than half a century ago, from the sulphurous acid gas from roasting the copper sulphides. In the first era of mining at Ducktown, i. e., from 1850 to 1870, the ore mined was the rich, secondary, black copper, resulting from leaching the original low-grade sulphides. When this was exhausted the mines closed down. But cheap fuel and favorable rates of wages for labor enabled the mines to open again in 1890, when pyritic smelting had become successful. Lately the yield has been as low as 1.55 per cent copper. Two years ago the sulphurous gases were converted into sulphuric acid, and the project was found doubly successful. It has yielded a profit to the copper smelter and has also furnished sulphuric acid at much lower cost to the producers of phosphate rock in the same State.

The sulphur from Louisiana, together with that from pyrite in Virginia, and from the copper ores mentioned above have brought the production of sulphuric acid and the superphosphates to a low cost that is most satisfactory, and little improvement need be expected. The materials are mined, manufactured and consumed in the South. There is, however, room for great development in the production of potash and nitrogeneous fertilizers.

The experiments of Dr. Allerton Cushman in the Department of Agriculture have shown the possibility of utilizing the potash in the "orthoclase" feldspars of the mica mines and in many Southern granites, directly as fertilizers in combination with superphosphates and nitrogeneous matter. In comparison with the great cost of obtaining potash salts from Germany, this should prove a great saving as well as the development of a new industry. Every effort should be made towards having this investigation pushed to a successful conclusion. The project of utilizing electric power for the manufacture of "nitro-lime" and nitrates from the nitrogen of the air has already been described in a previous article. It is understood that elaborate plans are being formulated for the development of this project in several localities in the South by American and German interests. This will leave the South entirely independent in regard to fertilzers and an exporter to less-favored regions.

STRUCTURAL MATERIALS.—Reference has already been made to the use of the marbles of Tennessee and Georgia to supply orders of the principal Northern concerns for marble in the South. Similar organization will doubtless be effected in the granite, sandstone and slate trades, but the South is entitled to a much greater share of the trade in plastic structural materials. The residual kaolins of the Carolinas and Georgia and the sedimentaries of Mississippi and other States are in position to fill nearly any kind of special need, and hence it is no surprise to see the clay products increasing rapidly in the South, as shown by Jefferson Middleton's statistics in the "Mineral Resources" reports. It is interesting to note that these clay products made in the South increase more rapidly than the sale of raw clays for manufacture elsewhere.

Burchard, in "Mineral Resources of 1908," shows that the stage of keen competition has been reached in the cement trade, with the consequent consolidation of interests and the closing of small and badly-located mills. The next step is the location of new mills by which transportation costs will be lowered. This has already begun by the building of a large plant in Smythe county, in Southwest Virginia, and also by utilizing the peculiar gypsum sands in Otero county, New Mexico. The occurrence of gypsum at other places remote from centers of supply, as in Northern and Central Florida, calls for increased production of plaster of Paris in that State.

GLASSMAKING.—Practically no glass is made in the South outside of St. Louis, Louisville and Baltimore and the towns bordering the Ohio River in West Virginia. Yet nowhere are the raw materials cheaper and of better quality. Galveston could gather the necessary sand and limestone from nearby points, salt and sulphur for salt cake from Louisiana, manganese from Cuba and oil fuel from Beaumont, all more cheaply than can be done in the North, and many other Gulf points are similarly well located for raw materials and for shipping the product.

If a summary of this article were attempted, it would consist in strongly advocating certain lines of industrial development tending to develop home industries.

Of foremost importance in Southern industrial development is the establishment of the Appalachian forest reserve; for in the administration of this reserve will come the development of water-powers by the assurance to capitalists that the water-powers will be preserved and the danger of flood and fire will be markedly decreased.

The development of electricity at low cost and in large units is needed not only for established uses, but means a new distribution of industrial activity consistent with late electro-metallurgical developments in iron and steel, copper, lead and zinc, tin, gold, fertilizer and a host of electro-chemical industries.

The key to mineral industrial advance in the South is water-power for electro-chemistry and electro-metallurgy.

THE GREATEST NEED IN THE SOUTH TODAY.

By HON. G. W. KOINER, Commissioner of Agriculture and Immigration of Virginia.

[Written for the Manufacturers' Record.]

The greatest need in our South today is people with energy and good morals. If they have any capital, so much the better for their welfare and the country's advancement. People who are not afraid of work can today in the South create and accumulate more money in a few years than in any country in the world. The Southern farmers have lately waked up and are demonstrating what can be done in "Dixie Land." The value of the crops grown in the South within the last two decades has increased from $675,000,000 to $2,500,000,000, and her mineral output has grown from almost nothing to $300,000,000. But, with more people to cultivate the 200,000,000 idle acres in the South, these values will be doubled in a much shorter period of time than the uninformed about the resources in the South would suppose. There is no country on the globe that offers greater opportunity to intelligent industry and capital for increasing rewards and handsome profits and growth in wealth than that portion of our country lying South of the Potomac River and stretching along the Atlantic to the Rio Grande River. The cheapest lands in the United States are there. The kindest soil and the most salubrious climate are there. The sun never illumined a fairer land, the plowman never turned a kinder soil, and the stranger never touched the hand of a more hospitable people.

This favored land needs more people. If the population of the South were as much (in proportion) as the State of Ohio, 102 per square mile, there would be 84,000,000 people instead of 28,000,000, as at present, whose energies would pour more values into the commerce of our country than the entire business of the United States is doing today. No man can compute the value of the agricultural gold mines that lie hidden in the soils of the South. The South needs people to work her idle acres intelligently and move the corn cribs, the meathouses and the hay barns from the West to each farm throughout the whole Southern country. The share system in the South gives the laboring man a better opportunity than the wage system in the West. There is an opportunity to every man with energy and a determination to work to enjoy the comforts of a home and become an owner of his home in the South today. The idle and shiftless, the unemployed labor in the cities of Europe and America are not wanted in the South, but the South needs people of energy, law-abiding and God-fearing, in great numbers. The value of lands increases with the population. The great number of cotton and other factories scattered all through the South have depleted the farms of their labor, for the South has established more factories during the past 10 years than any section of the world. The lands in the South are selling far below their real value, and no country in

the world offers such easy opportunities to the man with small capital to own a farm and become independent by intelligent farming. The soil is kind and easily improved. The crops, in variety and quality, cannot be surpassed in any country. The markets for all her products are 30 per cent. higher than in the West. Transportation facilities are first-class. The ample rainfall, the long growing season for the ripening and maturing of all crops and fruits, a salubrious climate, a hospitable and sociable people to live with and rear a family among—all these for less price than can be found anywhere on the globe. The opportunity for a more rapid agricultural development in the South has outrun the labor supply. With more people upon the farms in the South, hundreds of millions more in value would be produced annually.

There are tens of thousands of Scotch and English and Irish tenant farmers, who are hard-working and thrifty people, and are paying from $5 to $40 an acre money rents annually, and many of them supporting a family upon a small acreage, who would come to the South and soon become landowners if they knew the opportunities as they do exist there today. These people are excellent farmers, as a rule. They are the same stock of Scotch, Irish and English who came here and settled in the South 200 years ago, and whose descendants we Southern people are today. For what better purpose could the States in the South make appropriations than to let these tenant farmers know the splendid opportunities to become landowners in our Southern country. The South should exploit her resources and opportunities more in the West and Northwest. That rigorous climate is driving many people with capital from that country, who are looking for a better climate and cheaper farming lands.

It was immigration work that populated those wild Western lands and made them much higher in price today than our Southern land. The liberal appropriations made by Canada have settled up that country until those lands in Southern Canada which sold a few years ago for $10 per acre are now bringing $100 per acre. About 60,000 Scotch people settled in Canada last year, and the Scotch have made Canada what she is today.

The farmers are our wealth producers. The best assets the South can have are good farmers. They are not only our wealth producers, but they are the great conservative force in the life of our nation, and they are our enduring hope for the perpetuity of our American institutions, and the happiness of mankind depends upon a successful agriculture everywhere. The restlessness of the Northwestern farmers is sending many of them into the South each year. The tide is moving faster southward. Last year more than 2000 farms were bought in Virginia, bringing about $15,000,000 investment. Some of the railroads, through their industrial departments, and some papers and publications are doing fine work in exploiting the Southland.

I know of no paper that has shown more ability and energy and given more sound reasons that are convincing to any enterprising man than the MANUFACTURERS' RECORD. Its issues are an inspiration to our Southern people and a beacon light to the homeseeker and investor everywhere.

Liberal appropriations by our Southern States judiciously expended in looking for people of enterprise and capital would easily prove the best expenditures they could make. The increased value of land, the increased production of food supply and material for manufacture, the harnessing of more water-power, which exists in ample quantity, the impetus of railroad extensions to meet the demands for transportation—all these and a hundred other good reasons exist for settling up the millions of idle acres of our Southern country. The South cannot afford to allow such highly favored land to hide longer the rich treasures from the farm, the factory, the mine, and all the great results that will follow the development of these stupendous energies.

A REVIEW OF THE COTTON SITUATION.

By Col. Alfred B. Shepperson of New York.

[Written for the Manufacturers' Record.]

The calendar year now drawing to its close has been an eventful one for all interested in the production and the manufacture of cotton.

The cotton crop of the United States which was planted in 1908 and marketed during the year ending August 31, 1909, amounted to 13,817,000 bales and was the largest American crop ever grown, exceeding the great crop of 1904 by 163,000 bales.

The American crop of the season of 1888-89 was equal to 6,736,000 bales of 500 pounds net weight; that of 1898-99 equalled 10,940,000 bales, and that of 1908-09 was 13,458,000 bales, of 500 pounds net weight. The increase of the crop of 1898-99 over the crop of 1888-89 was 62½ per cent. The increase of the crop of 1908-09 was 2,518,000 bales, or 23 per cent., over the crop of 1898-99 and 6,722,000 bales, or 100 per cent., over the crop of 1888-89.

The size of the United States crop had doubled in the last 20 years and the percentage of increased production has far exceeded that of the cotton crops of India and Egypt. There can be no question of the ability of the United States to always produce hereafter sufficient cotton for the requirements of American cotton by the cotton mills of the world.

The size of the crops differs with the weather conditions for growth and maturity. When the conditions are very favorable the production has always been sufficiently in excess of the world's requirements to enable a surplus to be carried over quite ample to make up for the smaller crop which usually follows a large one.

The opening price in New York in January, 1909, for middling upland cotton was 9¼ cents per pound (being the lowest price of the year), and the price on December 28 was 15¾ cents, being an advance of 6½ cents. Except during the year 1904, so great a range in prices has not occurred in any year since 1873. The price in New York for middling upland cotton on August 31 last was 12⅘ cents, and the advance since that time has been 2.95 cents per pound.

Should there be no decline before the end of December, the year 1909 will close with the highest price for cotton in New York since March 10, 1904, when sales were made at 16.65 cents per pound for middling upland. On February 1, 1904, middling upland was officially quoted in New York at 17¼ cents, but no sales were actually made during that year above 16.65 cents.

After reaching the high price of 16.65 cents, the market steadily declined, and 6.85 cents per pound for middling upland was reached on December 20, 1904.

The great advance was due to speculation in "cotton futures," and the rapid decline which followed was precipitated by the failure in March, 1904, of Messrs. Daniel J. Sully & Co., of New York, who had been prominent in the speculation for high prices.

The cotton season (or year) for the cotton trade is from September 1 of one year to August 31 of the next year. The commercial cotton crop of the United States for the season ending August 31, 1909, was 13,817,516 bales averaging 514 pounds (gross weight) per bale, against a crop the previous season of 11,441,269 bales averaging 509 pounds (gross weight) per bale.

The highest quotation in New York for middling upland cotton during the season was 13.15 cents on July 13, 1909, and the lowest was 9 cents, on October 9, 1908. The range of fluctuations in the price of middling cotton in New York during the season was 4.15 cents, against 4.05 for the season of 1907-08, 3.95 cents for the season of 1906-07, and 2.80 cents for the season of 1905-06.

The consumption of cotton by the United States mills for the season of 1908-09 is estimated as equal to 2,399,000 bales of 500 pounds net weight by the Northern mills and 2,367,000 bales by the Southern mills, making a total for the country of 4,766,000 bales of 500 pounds net weight.

The increased consumption over the previous season was equal to 348,000 bales by the Northern mills and 170,000 bales by the Southern mills. These figures represent American cotton only and do not include any cotton of foreign growth. The imports of foreign cotton during the season were 101,278 bales of Egyptian, 33,653 bales of Peruvian, 5270 bales of East Indian and 1990 bales of Chinese.

The consumption of cotton of all kinds by the British mills for the season ending August 31 is estimated as 3,650,000 bales of 500 pounds net weight and of the Continent of Europe as 5,720,000 bales of 500 pounds net weight, exclusive of the cotton of its Asiatic provinces spun in Russia.

The increased consumption of cotton over the previous season is estimated as equal to 518,000 bales of 500 pounds net weight by the United States mills and 20,000 bales by the Continental mills; while the British mills consumed 133,000 bales of 500 pounds net weight less than for the previous season.

The total increase in consumption by the mills of the United States and Europe over the previous season was therefore equal to 405,000 bales of 500 pounds net weight. The total consumption of cotton by the mills of the United States and Europe was 14,136,000 bales, and of India and Japan 2,449,000 bales, making a grand total of 16,585,000 bales of 500 pounds net weight, being the largest consumption ever recorded, except that of the season of 1906-07, when the total was 16,643,000 bales.

The number of spindles now in operation or ready to put at work when required is estimated as 17,200,000 in the Northern States and 10,500,000 in the Southern States, making 27,700,000 for the United States; 55,600,000 in Great Britain; 39,000,000 on the Continent; 5,800,000 in India, and 1,700,000 in Japan, making a total of 129,800,000 for the countries named. The increase in spindles over the season of 1907-08 is estimated as 1,000,000 for Great Britain, 2,000,000 for the Continent, 1,200,000 for the United States, 50,000 for India and 50,000 for Japan, making a total increase of 4,300,000 spindles in the countries mentioned.

Compared with ten years ago, the increase in cotton spindles has been 10,000,000, being 21½ per cent., in Great Britain; 6,500,000, being 20 per cent., on the Continent; 9,600,000, or 53 per cent., in the United States, and 1,072,000, or 22⅘ per cent., in India.

During the same period the increased consumption of cotton by the mills (expressed in bales of 500 pounds net weight) has been 111,000 bales, or 3.7 per cent., in Great Britain; 936,000 bales, or 19½ per cent., on the Continent; 1,184,000 bales, or 33 per cent., in the United States, and 218,000 bales, or 17 per cent., in India. It will be noticed that the increase in consumption by the United States mills has been greater than the total increase in all European countries.

A comparison of the increase in spindles and consumption of cotton by the mills of our Northern and our Southern States with the figures of ten years ago shows a most wonderful progress by the Southern mills and tends to confirm the conviction that I have long held that in the not distant future the Southern States will be the chief center of cotton manufacturing.

During the period named the increase in cotton spindles in the Southern States has been 6,550,000, or 165½ per cent., while the increase in their consumption of cotton has been 1,003,000 bales of 500 pounds net weight, or 73½ per cent., by the Southern mills, and 181,000 bales, or 8⅛ per cent., by the Northern mills. These figures should be very gratifying to all who feel interested in and are proud of the progress of the South.

Except for the Carolinas, Georgia and Alabama, the weather conditions for the growth, maturing and gathering of the United States cotton crop of 1909-10, planted last spring, have generally been quite unfavorable, though not as much so as the reports of the United States Department of Agriculture would indicate. The crop is of fairly good grade and staple, except that in Texas the staple is shorter than usual. The dry and hot weather in Texas, which greatly reduced the yield and impaired the staple of its cotton crop, killed millions of boll-weevils. It is therefore evident that the weevils will be far less numerous and destructive next season.

During last season the boll-weevils did not advance further northward or westward than the previous season, their only advance being southeastward in Louisiana.

Owing to the unusually hot and dry weather last summer in many sections, the bales of the crop will probably average somewhat less in weight than those of the previous season.

The United States Department of Agriculture estimates the acreage for the present season of 1909-10 as 31,918,000 acres against its revised estimate of 33,370,000 acres for the season of 1908-09, being about 4½ per cent. less. If the department in

June, 1908, had estimated the cotton acreage as large as its "revised estimate," issued a year later, it is quite evident that the general estimates of the size of the crop of 1908-09 would have been about 500,000 bales higher than they were.

While the first estimate of acreage of the crop of 1908-09 made by the department was quite misleading, it was not as much so, however, as its estimate of June, 1906, to which an addition of 3,363,000 acres, or over 11½ per cent., was made by way of a "revision" in June, 1907.

The estimates of the United States Department of Agriculture should not be taken too seriously by the public. Its estimates of acreage have frequently been revised later on, and always by increasing them. Its December estimates of the yield of the cotton crops are usually 8 to 10 per cent. less than the commercial crops, and sometimes considerably more. In a series of years, I can recall but one season in which the department's estimate of yield was too high, and then the overestimate was not an important one.

Earlier in the season the estimates of the present cotton crop ranged from 10,000,000 to 12,500,000 bales, but the present estimates of the commercial crop are usually for from 11,000,000 to 11,300,000 bales, including "linters."

The average estimate of the members of the New York Cotton Exchange was for 11,231,000 bales; of the Memphis Cotton Exchange, 10,749,000 bales, and of the Liverpool Cotton Association, 11,462,000 bales.

Killing frosts in the cotton belt did not occur this fall as early as usual, and this partly made up for the lateness of the crop and the unfavorable conditions in many sections.

Well-informed correspondents in Texas think that the delay in the occurrence of killing frosts in that State added several hundred thousand bales to its cotton crop.

The advance of 2.95 cents per pound in cotton since September 1 and the fact that the price is now 6½ cents per pound higher than a year ago have naturally checked the activity of spinners in Europe and America and "short time" is being adopted in every direction.

The English spinning mills have agreed to run on "short time" until the end of February.

Liverpool correspondents think that the "short time" movement may curtail the consumption of cotton by the English mills as much as 500,000 bales.

The present prices of cotton and of cotton cloth and yarns allow no profit to manufacturers.

Until there is a radical readjustment of values no positive views can be safely formed respecting the consumption of cotton by the world's spinners.

While the adoption of "short time" by so many mills in the United States and abroad will cause great suffering and the deprivation of many of the necessaries and comforts of life to hundreds of thousands of mill operatives and those dependent upon them, it is a matter of congratulation that the cotton growers of the South have been able this year to profit by the high markets by realizing exceedingly remunerative prices for their crops.

It is unusual for our cotton growers to get the benefit of abnormally high prices, because they almost invariably occur after the farmers have marketed about all of their crops, and thus practically the dealers and speculators alone usually secure the high prices and large profits.

Recent advices indicate that the East Indian cotton crop may exceed that of last season by a million bales, and that the crop of the Asiatic provinces of Russia may be 100,000 bales more than last season. The conditions for the Egyptian crop are not as favorable as a few weeks ago, and the yield may prove to be about 150,000 to 200,000 bales less than last season.

The visible supply of cotton of all kinds on August 31, 1909, was 1,717,000 bales; the stock in European mills on that date was estimated by Mr. Thomas R. Ellison of Liverpool (in bales of 500 pounds net) as 1,526,000 bales; the stock in United States mills was reported by the United States Census Office as 909,000 bales; making the total available supply on August 31, 4,152,000 bales.

During the present season it is probable that India will export to Europe 1,700,000 bales, against 1,097,000 bales last season; that Egypt will export 70,000 bales, against 896,000 bales last season; and that Brazil, Peru, West Indies, etc., will export 270,000 bales. Should the American crop be 11,000,000 bales, the supply of cotton for spinners for the season of 1909-10 would be 17,822,000 bales.

In the figures for the visible supply on August 31 the stock in Bombay of 161,000 bales and the stock in Manchester of 50,000 bales are not included, as a large portion of the cotton might be under the control of spinners.

As already stated, the consumption of last season was 9,370,000 bales by the European mills and 4,776,000 bales by the United States mills. To this should be added the shipments from the United States of 198,000 bales to Japan and 174,000 bales to Canada and Mexico, making a total of 14,508,000 bales.

Upon this conservative basis of supply and consumption, there would be left at the close of the season on August 31, 1910, in the visible supply and the mill stocks about 3,314,000 bales of cotton, against 4,152,000 bales on August 31 last.

In August the indications were for an increased consumption of cotton during the season of 1909-10 by European and American spinners, and especially by the latter.

The curtailment of consumption from the adoption of "short time" by so many mills will probably result in the consumption of no more cotton than last season, and the high price of American cotton will cause the substitution for it of good grades of East Indian cotton whenever it can be done. During the season of 1903-04, when the price of cotton was so unusually high, the Continental spinners used a great deal of East Indian cotton in place of American cotton. A Continental merchant informed me that he had sold that season 65,000 bales of East Indian cotton to spinners who had previously used American cotton only. A few days ago the president a large Southern mill located in a fine cotton-growing district wrote me that over 6000 bales of East Indian cotton had recently been ordered by mills in his section. Cotton from the Broach district of India is clean and has a staple of seven-eighths to an inch in length. I have since learned that about 15,000 bales of East Indian cotton have already been ordered since September 1 for Southern mills, and chiefly of lower grades than Broach cotton.

The consumption of American cotton by the world's spinners during last season is estimated as 12,860,000 (running) bales, against 12,117,000 bales for the previous season, 12,432,000 bales in 1906-07, and 11,967,000 bales in the season of 1905-06.

New York, December 24, 1909.

Substantial, Permanent Basis of Southern Progress.

By D. A. TOMPKINS of Charlotte, N. C.

[Written for the Manufacturers' Record.]

A few days ago I was in the company of a gentleman and his wife from St. Louis, and they wanted to see a Southern cotton mill and its village. We visited one, and amongst other things, saw the school. The principal had the pupils go through some exercises and invited the gentleman from St. Louis to make a little address to the boys and girls, which he did with engaging grace and advantage to the pupils. In another room the young lady teacher invited me to make some remarks. I took occasion to call attention to the fact that there was a disposition to deprecate the dignity of cotton-mill work. I insisted that spinning and weaving were not lowly occupations, excepting as the spinner and the weaver might make it so. I stated that the field of weaving is as wide open for high-class work as that of any trade or profession in the world. The making of plain white cloth is merely the babyhood of the art, and the compensations for this primitive work are the cheapest; but infinite weaving is done which is higher-priced, and when we get into the field of fabrics where designs have to be made and reproduced, and where dobby work and jacquard work may make infinitely varied patterns, still we are not very far afield in the art of weaving. Fine embroideries, fine muslins and fine organdies with beautiful patterns printed are yet only in the industrial art, though they bring fine compensations. Going on into the field of fine arts, say of tapestries, knowledge and skill of high order are required, and I have lately read of a purchase made in Paris by J. Pierpont Morgan of a few small pieces which cost $75,000, which shows that compensations may be very high. I called to the attention of the children that the prerequisite of making better fabrics and of entering the field of fine arts in weaving was education. It is not for ignorant people to get big prices for anything they do, but for intelligence and understanding; the field is unlimited, and the compensation is practically unlimited.

It is now some 10 years ago that I made up a list of fabrics and of the prices at which they sell in the stores, and then showed what the cotton crop of North Carolina would be worth if our own people could turn the crop into any one of these fabrics. The crop of North Carolina then brought $15,000,000. The crop at the present day is considerably larger, and the price is considerably better, but the old list copied here will show the principle.

Showing the Value of a North Carolina Cotton Crop of 500,000 Bales.

At cotton at 6 cents per pound.		If manufactured.
$15,000,000	Duck at 14c. per lb	$35,000,000
15,000,000	Drilling at 16c	40,000,000
15,000,000	Sheeting at 18c	45,000,000
15,000,000	Bleaching at 20c	50,000,000
15,000,000	Tick at 24c	60,000,000
15,000,000	Cheviot at 26c	65,000,000
15,000,000	Denim at 30c	75,000,000
15,000,000	Plain gingham at 34c	85,000,000
15,000,000	Window-shade cloth at 34c	85,000,000
15,000,000	Madras at 40c	100,000,000
15,000,000	Longcloth at 70c	175,000,000
15,000,000	Mercerized cloth at $1	250,000,000
15,000,000	Fancy gingham at $1.60	400,000,000
15,000,000	Poplin at $1.80	450,000,000
15,000,000	Embroidered ginghams at $2.50	550,000,000
15,000,000	Fancy ginghams at $2.80	700,000,000
15,000,000	Persian lawn at $4	1,000,000,000
15,000,000	Embroidery at $20	5,000,000,000

The product enumerated at the beginning of the above list requires comparatively little knowledge or skill. The development of values as the list continues can only be accomplished pro rata with the development of knowledge and skill. The production of the finer fabrics, having really very much enlarged values, requires not only ordinary knowledge and skill, but special and high-class technical education.

The influence of cotton manufacture in the South has already been felt in the enhancement of the value of the raw material. The factories have relieved the competition in the cotton fields until cotton is now worth easily three times what it used to be. The further development of special knowledge, skill and education will tend to strengthen and maintain the higher price of the raw material, which, in turn, brings the necessary capital to pay for other education, and for the building of further factories to get material results from this enhanced education.

Many things are now opening up to give additional strength and stability to every advanced movement made in the South. The next movement in agriculture should be to raise the home supplies, to save sending so much money out of the country for such necessities as flour, beef, bacon, lard, etc. The best benefits of the increased price of cotton will only come after this development of producing home supplies. Such a thing is as easily within the possibilities as it has been found possible to develop manufactures, especially cottonseed-oil mills and cotton mills. The advantage of producing home supplies would not be less than those of manufactures.

Very few people realize the extent to which the South of today is a totally different country from what it was in 1860 or in 1870. Immediately succeeding the Civil War the cotton States had practically no other income except that received for the cotton crop. Speaking in round numbers and in round periods, we find the following figures as to the average annual production of cotton and the average annual income received for it since the Civil War:

First	decade	2,500,000 bales at	24c	$300,000,000
Second	"	5,000,000 "	12c	300,000,000
Third	"	10,000,000 "	6c	300,000,000
Fourth	"	10,000,000 "	12c	600,000,000
Fifth	"	12,000,000 "	13c	800,000,000

From the third to the fourth decade shows the influence of factory development, and from the fourth to the fifth emphasizes the influence and other diversification and helps to hold production in check and increase values.

It will be observed that in the fourth decade the quantity of cotton remained the same as in the third, but the price doubled. Thus the gross income from cotton was made $600,000,000 instead of $300,000,000. In the fifth decade this gross annual income for cotton has reached nearly $800,000,000.

In addition to this there has been developed a cottonseed-oil industry, and today the cottonseed are worth $100,000,000 or more. Besides this, $200,000,000 worth of cotton mills have been built, and the product from these over and above the price of the cotton is about $200,000,000.

The development of this factory system has made markets for perishable products,

which yield at least $100,000,000 of value where formerly nothing came. If we consider other manufactures and divers agricultural pursuits, we readily find that the gross annual income of the cotton-growing States has enhanced within the last 15 years from $1,500,000,000 to certainly $3,500,000,000, and possibly to $4,000,000,000, if the products of all the factories and mines were included. In addition to all this, there are water-powers throughout the cotton-growing area, but more particularly in the Piedmont region, which would ultimately yield 2,000,000 or 3,000,000 horse-power. There is now being developed for transmission water-powers in the Charlotte and Greenville sections which will aggregate 300,000 horse-power. This power is capable of doing as much work as 3,000,000 common laborers, and has the advantage of as many more laborers, in that it will do its work night as well as day. Thus the power may be used to spin and weave cotton in the day time and to do interurban traffic on trolley systems at night. The water-powers near Charlotte will do more work than the entire population of the State can do working as human labor.

Cotton is naturally the basis of much of the undertakings looking to getting the best results. Several of the Southern States have built textile schools, and most of them have textile departments in some of their schools. As the development of these natural forces and resources continue, and as the education, knowledge and skill are developed, according to the plans already formulated and already in practice are brought together, the results obtained will be similar to those when yeast is put into a lump of dough. Separately the natural forces and resources are not worth much; separately technical education is not worth much, but when we bring the two together the limits of what may be accomplished are hardly conceivable.

One of the advantages which the Southern States have is the colored brother. Here is a reserved force of labor not enjoyed by any other part of the United States. Before the war there was a perfect understanding between the two races—one was slave and the other master. After the war there was a misunderstanding, which led to a long period of confusion and semi-anarchy, but happily now the outcome of reconstruction has brought with it another understanding between the two races in the South, and in this new situation there is a perfect harmony, and the colored brother becomes a good free citizen. Formerly it was thought that the immigrant did not come South because of the negro. Now it is well known that the immigrant did not come South because of the institution of slavery. The negro is here now in larger numbers than before the war, and yet it transpires that he does not stand in the way of manufactures, nor of commerce, nor of literature, nor of the arts, and the immigrant is again coming, so that he does not stand either in the way of white emigration.

There is no doubt that the improved condition of the South up to the present time is permanent. There is no doubt in my mind but that it is simply the beginning of even better things. Southern development has gone far enough to prove that the industrial South under free institutions is permanent. The education necessary to the handling of natural forces and resources is being pushed forward as rapidly as it is possible for the people to progress in such a matter. The character of the work done is advancing in exact proportion to the education, and the promise of values out of cotton, as exhibited in the table at the beginning of this article, has every expectation of being fulfilled. Time and patient work alone are necessary.

THE COAL FIELDS OF THE SOUTHERN STATES.*

Their Areas and Contents, With a Review of the Past and Possibilities of Future Production.

By EDWARD W. PARKER, United States Geological Survey.

[Written for the Manufacturers' Record.]

In the present paper the somewhat indefinite geographic division known as the Southern States is assumed to include Arkansas, Oklahoma and Texas, but does not include either Missouri or Kansas. The coal areas of that portion of the United States herein considered are all south of the Mason and Dixon line and the Ohio River, and are east of the 100th meridian of longitude. They comprise in their aggregate 21.66 per cent. of the total coal-bearing portions of Uncle Sam's domain. They contained, before the miner's pick had begun to cut its way into the stores of fuel, 15.6 per cent. of the total coal supply, and contributed 20.6 per cent. of the total output of coal in the United States in 1908.

According to the estimates prepared by Mr. M. R. Campbell of the United States Geological Survey, the areas known to contain workable coal in the Southern States aggregate 70,966 square miles. The quantity of coal stored in the ground when mining began is estimated to have amounted to nearly 500,000,000,000 short tons. This supply, according to a report made by Mr. Bennet H. Brough to the Royal Commission of Mines for Great Britain in 1904, is two and a half times the coal supply of the United Kingdom, more than four times that of Germany, and exceeds by a substantial figure the combined coal reserves of Great Britain, Germany, France, Austria-Hungary and Belgium. Mr. Campbell's estimates of the coal reserves of the Southern States put the original supply at 492,438,000,000 tons. The total supply of the five European countries mentioned is placed at 470,000,000,000 tons, or more than 22,000,000,000 less than that of the 11 Commonwealths which constitute the coal producers of the Southern States. The total production of coal in the Southern States from the time of earliest mining to the close of 1908, the latest date for which complete statistics are available, has amounted to 1,182,895,556 short tons, and if we assume that for every ton of coal mined half a ton is lost, the exhaustion has amounted to approximately 1,775,000,000 tons. From this it appears that the supply still remaining exceeds 490,000,000,000 tons, and this amount exceeds by 20,000,000,000 tons the reserves of the five principal coal-producing nations of Europe.

In 1907, the banner year of industrial activity in the history of the United States, the Southern States produced an aggregate of 98,000,000 short tons of coal. In 1908, notwithstanding the panic and business depression, the coal production in this section of the country amounted to 85,770,967 short tons. During 1909 there has been a gratifying recovery from the depression of the preceding year, and while the tonnage may not equal the record made in 1907, it will probably not fall much, if any, below 95,000,000 tons. Even these figures, and still allowing half a ton lost for every ton recovered, when compared with the supplies nature has provided, do not appear at first sight to give any reason for apprehension as to the future, or at least the immediate future, so far as we depend upon coal as a source of light, heat and power. It should be remembered, however, that it is only in recent years that we have done much in the way of coal mining. Few realize that over 90 per cent. of the total coal production in the Southern States has been mined during the last quarter of a century. In fact, it may be said that we have only just begun to mine coal, although some was produced in the Richmond basin of Virginia early in the last century. Up to the close of 1858—50 years ago—the total production of coal in the Southern States had amounted to 18,645,399 short tons. In the following decade, although mining operations were necessarily interrupted by the Civil War, the production was nearly equal to that of the previous half-century, and amounted to 17,691,390 short tons. For the 10 years from 1869 to 1878 the coal production was 43,049,611 tons, nearly two and a half times that of the preceding decade, and over 6,700,000 tons in excess of the total production to the beginning of the period. In the Southern States the large ratio of increase has been maintained with each succeeding decade since 1878. From 1879 to 1888 the total production of coal was 109,281,262 short tons, or more than two and a half times the preceding decade's production. In the 10 years from 1889 to 1898 the production was more than 2.6 times that from 1879 to 1888, amounting to 289,695,954 short tons, and in the decade closing with 1908 the production amounted to 704,531,940 short tons, or 2.4 times the output for the 10 years from 1889 to 1898.

The accompanying diagram illustrates how these decennial increases have been made in the several States. The beginning of the curves at the left represents the total production from the earliest times to the close of 1858. Only five of the Southern States had previously produced any coal worth mentioning. Virginia, where the first coal was mined in the United States, had up to this time contributed the larger part of the tonnage, nearly 50 per cent. of the total, though Maryland from 1842 on was the leading producer. The drop in Virginia's curve during the next two decades was due to the separation of West Virginia from the Mother State as a war measure in 1863, thus taking away from Virginia all of the then known coal areas except the unimportant Richmond basin. Alabama's production at this time was insignificant, Kentucky and Tennessee both being much in advance of Alabama. The real development in Alabama began in the early eighties, and the effect is shown in the fact that in the decade from 1879 to 1888 the output for the State was 20 times that of the preceding decade. All of these five States show notable increases during the last 30 years except Maryland, the exception in the case of that State being due to the comparatively restricted areas and to their relatively high state of development 50 years ago.

It is to the record shown by West Virginia, however, that attention will naturally be drawn. The curve of increase during the last two decades is startling in its abruptness. In the decade ending in 1898 the production was more than three times that of the preceding one, and during the last 10 years the output was again nearly trebled. Compared with the production of 10 years ended in 1888, the production of the last 10 years shows an increase of nearly 1000 per cent.

The three States west of the Mississippi River did not appear among the coal-producing States until 1880, but since that date they have added materially to the grand total, particularly during the last 10 years, in which period Arkansas has produced nearly 19,000,000 tons, Oklahoma (formerly Indian Territory) over 27,500,000 tons and Texas over 12,000,000 tons. The small area in Northwestern Georgia produced 2,500,000 tons of coal in the 10 years from 1889 to 1898, and nearly 3,500,000 tons from 1899 to 1908.

During this day and generation, when the conservation of our natural resources is a topic of somewhat lively discussion, and the subject of more or less learned articles from the trenchant pens of numerous newspaper and magazine writers, the question naturally arises as to how long the coal reserves will stand this continually increasing drain upon them. As previously stated, the estimated original supply of coal in the Southern States was, in round numbers, 492,000,000,000 tons, from which there have been drawn, to the close of 1908, less than 1,200,000,000 tons, or, including the loss in mining, an exhaustion of, say, 1,800,000,000 tons. There remain, then, still upward of 490,000,000,000 tons in reserve.

Let us assume that we shall so improve our methods of mining coal that we shall recover 80 per cent. of the product, instead of the 66.6 per cent., as now estimated. The Southern States would then be able to produce, say, 400,000,000,000 tons of coal. The production in the last 10 years was 700,000,000 tons, and this was nearly two and a half times that of the preceding decade. Moreover, the mines which produced this output in the last decade could have yielded, if pushed to their capacity, from 1,000,000,000 to 1,200,000,000 tons. Now, if the production simply doubles for a few decades, the result would be about as follows:

Decade.	Production. Short tons.
1909-1918	1,400,000,000
1919-1928	2,800,000,000
1929-1938	5,600,000,000
1939-1948	11,200,000,000
1949-1958	22,400,000,000
1959-1968	44,800,000,000
1969-1978	89,600,000,000
1979-1988	179,200,000,000

The total production by the end of this period will have amounted to about 360,000,000,000 short tons, and there would be only 40,000,000,000 tons remaining, or about two years' supply.

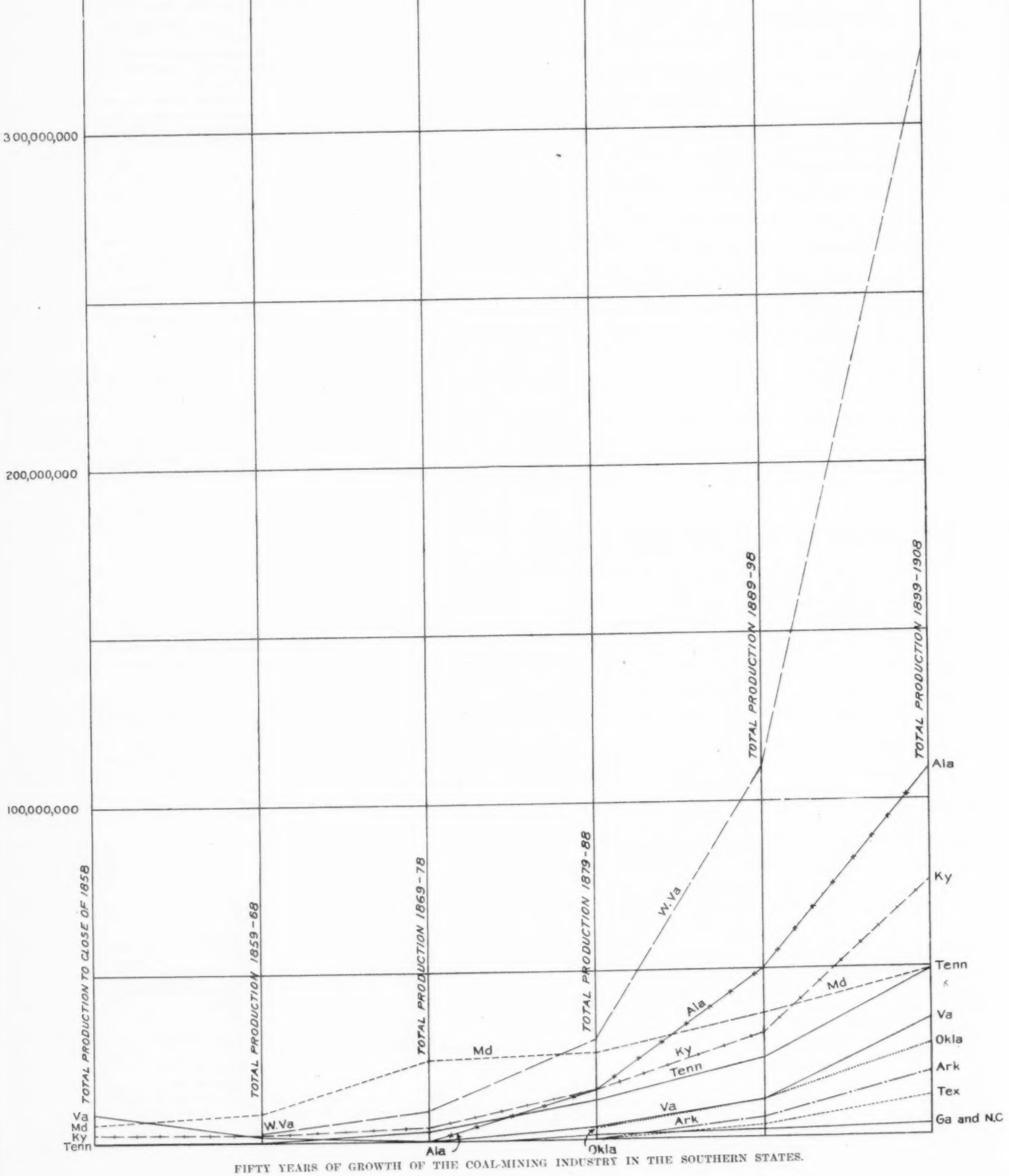
Although it is true that 25 years ago no one would have predicted that the annual production of coal in the Southern States at the present time would be more than four times what it was then, a fact that has come to pass, still, it is not within reason to predict that any such peradventure as that set forth in the foregoing table will face future generations. There must come a time when production will cease to increase materially and become approximately constant before the period of decline, which must also set in. Possibly a more rational look into the future would see an increase for the coal production of the Southern States of about 90 per cent. in the next 10 years, 80 per cent. in the succeeding, 70 per cent. in the next, and so on until it remains practically steady. In such an event the future tonnage by decades would be as follows:

Decade.	Production. Short tons.
1909-1918	1,330,000,000
1919-1928	2,394,000,000
1929-1938	4,070,000,000
1939-1948	6,512,000,000
1949-1958	9,758,000,000
1959-1968	13,674,000,000
1969-1978	17,777,000,000
1979-1988	21,332,000,000
1989-1998	23,465,000,000

According to this calculation the production would become constant about the end

*By permission of the Director of the United States Geological Survey.

of the present century, with an annual output of about 2,350,000,000 tons. The total production will have amounted to about 100,000,000,000 tons, or one-fourth of the supply. Even this seems beyond the bounds of possibility. There are those well informed on the question of the coal trade who believe that when the production of the entire United States has reached a total of 1,000,000,000 tons a year the maximum output will have been attained, and the preceding table puts that for the Southern



FIFTY YEARS OF GROWTH OF THE COAL-MINING INDUSTRY IN THE SOUTHERN STATES.

States alone at over 2,000,000,000 tons within a hundred years from now. It has been argued that the knowledge we are gaining in the way of securing greater economy and efficiency in the utilization of coal will effect a relative reduction in the consumption and thus limit or decrease the production. Experience does not bear out this reasoning. Past history has shown that the results of increased efficiency have been increased production of manufactures and the development of other methods of utilization which extend rather than decrease the consumption of fuel. Dr. Robert T. Moore, in a presidential address before the Institution of Mining Engineers at London, England, May 27, 1909, said:

"It is a striking fact that notwithstanding all the improvements which have been introduced to economize coal in the various industries, the total consumption has gone on increasing. It seems as if the greater the economy becomes the larger is the consumption.

"There have been atmospheric engines, Watt's condensing engines, high-pressure

engines, compound engines, triple and quadruple expansion engines, turbines and gas engines, each being an improvement on its predecessor, until the coal consumed per horse-power per hour has been reduced from over 10 pounds to three-quarters of a pound; the methods of iron smelting have been improved until the amount of fuel used has been reduced from eight tons per ton of pig-iron to considerably under two tons; the processes for the manufacture of gas have been improved, and the whole history of the century has been a long series of savings in fuel. Yet the total consumption goes on steadily increasing. It would seem that the more the cost of power is cheapened the more are the purposes for which it becomes available."

Dr. Moore predicts that for some considerable time at least the coal production of the world will go on increasing, and the Southern States, with their enormous possibilities for industrial development, will, if the history of the past 50 years may be taken as a guide for the future, be a section which will show increases in proportion certainly as large as those of any other part of the United States or any other countries of the world.

In few, if any, parts of the country has there been recently so much railroad building for the development of coal properties as in the Southern States. The most noteworthy undertaking of this kind, an epoch-making undertaking in railroad building, was the completion in the early part of 1909 of the Virginian Railway. This was the first railroad in the United States to be built from the inland toward the seaboard, and having for its primary object the furnishing of a new outlet for the product of the coal mines. Moreover, it is a railroad built "for fair." It is a model of strong construction, good roadbed and low gradients, and it will become (in fact it is already) an important factor in the coal trade of West Virginia. The first shipments over this line were made in March, 1909, and the total coal traffic from then to the close of the year, it is anticipated, will approximate 1,500,000 tons. Within two years the Virginian is expected to be handling 5,000,000 tons of coal from the Pocahontas and New River fields.

Second in importance only to the Virginian Railway, in the way of new construction for coal traffic, has been the completion of the Carolina, Clinchfield & Ohio Railroad, begun some 20 years ago as the "Three Cs" (Charleston, Cincinnati and Chicago), later known as "South & Western," and finally completed under its present name. This line has not a seaboard terminus, but it penetrates some of the richest coal lands of Eastern Kentucky and Southwestern Virginia. By the middle of 1910 this road expects to be handling about 2,000,000 tons of coal.

Another, not quite so recent, addition to the transportation facilities for coal development has been the construction of the Virginia & Southwestern Railroad, since acquired by the Southern Railway, from Bristol, Tenn., to the Black Mountain district of Lee county, Virginia. This field is also reached by a branch of the Louisville & Nashville Railroad. It is a region of great promise, and its development may be said to have only begun.

In the western part of Kentucky a large amount of new development is expected to follow the completion of the Kentucky Midland Railroad from Central City, in Muhlenberg county, to Paducah, on the Ohio River. This road is said to furnish an outlet for 75,000 acres of virgin coal land, and the Kentucky Midland Coal Co., a new corporation, is opening properties that alone are expected to furnish an output of 5000 tons daily. In Texas the Wichita Falls & Southern Railway has completed a branch line from Wichita Falls to the bituminous coal areas of Young county, and considerable work in the development of a new region is now in progress.

In considering the progress made in the Southern States as written in the history of the coal-mining industry, it is well to call attention to certain economic conditions that possess peculiar interest. The development of coal mining in Alabama has been coincident with the development of the iron and steel industry and the building up of important manufacturing communities. On the other hand, West Virginia, whose coal production is more than three times that of Alabama, has shown comparatively little progress in manufactures. It is true that West Virginia has not the local iron-ore supply, which forms the basis of Alabama's industrial growth. But so far as that is concerned, neither has Pennsylvania, nor Ohio, nor Illinois, all of which are important iron-making States. The facts are that these States got the start of West Virginia, and when attention was directed in the early eighties to the unrivalled coal resources of West Virginia, the manufacturing enterprises already established in other States furnished the markets for the fuel. Moreover, the controlling interests of the railroads that built into the coal fields were for securing the coal and coke for freight rather than building up factories to consume the fuel near at home. Look at the result. The United States Census for 1905 shows that the gross value of the manufactured products of West Virginia in that year was $99,000,000, whereas the value of the products from the mills and factories of Alabama (with less than one-third the coal production) was $109,000,000.

The coals of West Virginia are of the highest quality of the bituminous and semi-bituminous varieties. They excel for steaming and coking purposes the coals of Alabama, yet in 1907 the average price of Alabama coal at the mines was $1.29 per short ton, while that of West Virginia was 99 cents. In 1908 the average prices were $1.26 for Alabama and 95 cents for West Virginia coal.

These facts clearly point a moral if they do not adorn a tale. The shipping out of the high-grade coals of West Virginia for feeding the fires of manufacturing establishments in other States has not aided, but has seriously retarded the building up of industrial communities that would make for the greatest prosperity and the inteiligent development of the resources of the Commonwealth. And what is true of such a policy for a State is equally true for the nation as a whole. The writer has no sympathy with the movement to foster an export trade in fuel. In order to meet the competition of other coals in foreign markets it is necessary to send out the highest grade coal, and it can only be done at such prices that are not properly remunerative to the producers. If we do not need these coals now, they will be needed for the not very remote future. We can do much better by utilizing our coal for increasing the output of our factories and mills and exporting our finished products. It is difficult, however, to see how the exportation of coal can be prevented or restricted when "'tis true, 'tis pity, and pity 'tis 'tis true" that the Constitution of the United States prohibits the placing of any duty on exports.

CONDITIONS IN OKLAHOMA.

By Dr. Charles N. Gould, State Geologist, Norman, Okla.

[Written for the Manufacturers' Record.]

Oklahoma—opportunity. The two words are synonymous. Oklahoma is a land of wonderful resources, all undeveloped; a land of virgin soil, unscored by the plow; of virgin forests, untouched by the ax; of marvelous mineral wealth unmined. It is a land of many rivers, with broad, fertile valleys; a land of copious rainfall and sunny breezes, a land inhabited by 2,000,000 happy, contented people.

Oklahoma stretches across the plain from the volcanic peaks which make the foothills of the Rocky Mountains to the cypress swamps along the Red River, which continue to the Mississippi. No State possesses a greater variety of soil and climate, timber and prairie, of resources both agricultural and mineral, than does Oklahoma. In general the western part of the State is a broad, rolling prairie, with few hills or mountains. Eastern Oklahoma is often hilly, and is in most places covered with heavy growths of timber, chiefly oak, pine and hickory.

Ten large rivers cross the State, flowing southeastward. All are tributary to either the Arkansas or Red rivers, which flow into the Mississippi. These rivers, in addition to the two just named, are Grand, Verdigris, Salt Fork, Cimarron, North Canadian, South Canadian, Poteau and Washita. The valley of Grand River is as fertile as the valley of the Susquehanna; the valley of the Verdigris rivals the Miami; the Cimarron valley excels the Wabash; the valley of the North Canadian is as fertile as the valley of the Illinois, and the valley of the Washita as productive as that of the Tennessee.

Nor are the upland plains lacking in fertility. The broad prairies in Western Oklahoma are capable of producing a great variety of crops. The hilly uplands in the eastern counties are more productive than the Piedmont region in Pennsylvania or Virginia. Few States in the Union can produce a greater variety of crops. Cotton is the great staple in the southern half of the State. The fact that Oklahoma's cotton took first prize at the St. Louis Fair is a guarantee of the excellence of the material. In the northwestern counties wheat is the principal crop. Corn is produced abundantly in all parts of the State. Oklahoma is the paradise of the stockman. No finer cattle, hogs nor horses can be produced anywhere. Alfalfa is raised in practically every township. Fruits of all kinds thrive throughout the State. Many farmers have made small fortunes raising potatoes for Northern markets; others have become comparatively wealthy raising sweet potatoes, melons or strawberries.

The mineral wealth of this State is very great. Oklahoma possesses deposits which for all practical purposes are inexhaustible, comprising nearly twenty valuable minerals. There is no way of reaching anything but approximations, but, taking the best data at command, the probable amount of certain minerals in the State are as follows:

Coal, 8,000,000,000 tons;
Asphalt, 35,000,000,000 tons;
Glass sand, 50,000,000,000 tons;
Marble, 4,000,000,000 tons;
Gypsum, 123,000,000,000 tons;
Lead and zinc, enormous deposits, probably as great as Missouri;
Salt, enough to make 100 carloads per day.

For the last two years Oklahoma has led the United States in the production of petroleum, the amount being between 45,000,000 and 50,000,000 barrels per year. The amount of gas already in sight is probably more than 2,000,000,000 cubic feet daily. Only a small part of the oil and gas territory has yet been developed. Limestone as good as the Bedford stone is found in large quantities, and stone suitable for burning into lime or for ballast and concrete occurs over thousands of square miles. Sandstone is found in every county in the State. Gabbro and porphyry form mountains hundreds of feet high and many miles in length. Granite of a great variety of shades and textures occurs in mountain ranges 60 miles long and 1000 feet high. Clay and shale of good quality occur in every county. Building sand and gravel are widely distributed. Portland-cement rock occurs in half the counties of the State, and is in most places close to fuel.

Besides all of these minerals, which are in inexhaustible quantities, Oklahoma has iron, copper, novaculite, mineral paint, volcanic ash, phosphate and tripoli in quantities more or less abundant.

With all this array of minerals, very little has been developed. Oklahoma imports practically all her building stone, lime, salt, pressed brick, tile, pottery, glass sand and most of her Portland cement and gypsum plaster, although the raw materials for manufacturing them, as well as the fuel for their manufacture, are present in great quantities.

In Western Oklahoma, where the country has been settled for 15 or 20 years, farm lands sell for from $20 to $50 per acre. This land was originally opened to settlement at various times by the United States Government. Most of it was taken by men whose only thought was to sell the land for what they could get out of it. During the past few years values in this part of the State have increased very rapidly. Immigration from Northern and Eastern States has added greatly to land values. Farmers from such States as Iowa, Indiana and Illinois have sold their farms for from $100 to $150 per acre and have invested in Oklahoma, where land which will raise as much as the farms which they left can be purchased at one-fourth the price. So it is no uncommon thing for a Northern farmer to sell a quarter section and invest in a square mile of Oklahoma land.

In Eastern Oklahoma, formerly the Indian Territory, conditions are quite different. Here the land belonged not to the United States Government, but to the Five Civilized Tribes—Cherokee, Creek, Choctaw, Seminole and Chickasaw. During the last few years these Indians have taken their allotments of land, each individual receiving from 100 to 600 acres, depending upon local conditions and the quality of the land. Up until the last few months the Indians were not permitted to sell and good title could not be obtained to the greater part of this land. An act of Congress recently passed, however, made titles good, and much land has changed hands within the past few months. The conditions just alluded to have materially affected land values. In most of the eastern counties raw land as good as the best of the Tennessee or Illinois lands, still virgin soil and capable of producing a great variety of crops,

may be purchased at prices ranging all the way from $5 to $30 per acre. Land which is under cultivation will range from $15 to $50 per acre, while the best of the bottom land is held at still higher figures. This in a region where the rainfall is 35 to 45 inches per annum.

At the present time perhaps 60 per cent. of the land in Western Oklahoma is under cultivation, while in the eastern part of the State the amount under the plow does not exceed 30 per cent. The average in the entire State will approximate 35 to 40 per cent. Of the mineral resources not one-half of 1 per cent. has been developed.

Within the past few years the growth of the cities in Oklahoma has been extremely rapid. Twenty years ago Oklahoma City consisted of a station-house and a dozen shacks out on the prairie. Today it is a modern city of 65,000 people, with 75 miles of asphalt streets, 200 miles of sidewalks, 200 jobbing and wholesale houses, and with dozens of 8 and 10-story skyscrapers, either completed or in the process of erection.

Muskogee, in the eastern part of the State, is not far behind either in population or improvements. Such towns as Tulsa, Shawnee, Enid, Ardmore, Guthrie, Chickasha, Bartlesville and McAlester have 10,000 to 20,000 people each. Immigration from Eastern States is constantly adding to the population of the cities and the country.

There was once a time when Oklahoma was "wild and woolly," but that time has passed. The State has been accused of being educationally mad, and the criticism may be true if the establishment of numerous educational institutions constitutes madness. The State schools are as follows: The university at Norman; university preparatory schools at Tonkawa and Claremore; six State normal schools, at Edmond, Alva, Weatherford, Tahlequah, Ada and Durant; an agricultural college at Stillwater, and six branch agricultural schools at Warner, Broken Arrow, Tishomingo, Lawton, Thomas and Goodwell. In addition to these there is a girls' industrial school at Chickasha and a boys' industrial school at Pauls Valley. There are also a dozen or more denominational colleges scattered throughout the State.

It is not necessary in Oklahoma to begin a conversation with a remark about the weather. One is safe in asking, "Where are you from?" The oldest native of old Oklahoma is not yet old enough to vote. The inhabitants in Oklahoma, now about 2,000,000 in number, come from every State in the Union, Texas, Kansas and Missouri heading the list, but the State is full of people from Kentucky and Tennessee, Georgia and Carolina, Nebraska and Wisconsin. Oklahoma is a meeting place of the clans, where the man from the South learns to raise wheat and alfalfa and the man from the North cultivates cotton and eats hot bread. Animosities are forgotten, prejudices are concealed, and the descendant of the Puritan and the Cavalier work hand in hand in the upbuilding of the development of what all firmly believe to be the greatest State in the Union.

VAST SHIPPING POSSIBILITIES OF THE SOUTH.

By BERNARD N. BAKER of Baltimore.

[Written for the Manufacturers' Record.]

It is doubtful if the South realizes what a magnificent asset it has in the 5000-mile coast line which extends from the head of the Chesapeake Bay to the mouth of the Rio Grande. Its length exceeds that of the remaining coast line of the United States, with the exception of Alaska, and its climatic conditions render its navigation possible at all seasons of the year. From the port of Baltimore to Corpus Christi a chain of magnificent harbors invite the traffic of the world. The South's interior areas are rich in resources. Millions of acres of fertile lands, tens of millions of feet of standing timber and almost illimitable deposits of coal, iron and other minerals are tributary to this coast line. Prosperous cities have risen since the Civil War, manufacturing interests have settled nearer the sources of their raw material and great railroads have networked the whole territory.

The South is at last conscious, it seems, of the great natural wealth of its fields and mountains and water-courses, but it has not awakened to the fact that its location with relation to South America, Central America and the Orient will give it a commanding position when the Panama Canal is completed and the trade opportunities of the new markets are opened to its commerce. This I regard as the most promising opportunity which the future holds for the South, and it is probably least appreciated of any of the great forces which have combined to hurry the South's growth and development.

How many people realize what the Panama Canal may mean to the South? How many have realized that Valparaiso, Chile, is almost due south from Savannah, and that New Orleans is west of that South American city? How many have calculated the distances between the Southern seaports and those of Central and the west coast of South America, and found that the Hamburg merchant must ship his goods 3308 miles farther to reach the Chilian merchant than the Charleston (S. C.) merchant, and that the Liverpool mail steamer must sail 3469 miles further to reach Valparaiso than the mail steamer from Key West, Fla.? A glance at the table of distances will show that the South has the advantage of the commercial world in its relation to the Panama Canal. Some of these distances are as follows:

Baltimore to Colon	1968	nautical	miles.
Norfolk "	1801	"	"
Charleston "	1563	"	"
Savannah "	1568	"	"
Mobile "	1371	"	"
New Orleans "	1380	"	"
Galveston "	1481	"	"
Key West "	1086	"	"
Pensacola "	1344	"	"

Now glance at the distances between other productive centres and the Canal Zone. The Isthmus is used as a basis because it is the hub about which the interchange of commerce of three continents will revolve. These distances are as follows:

Liverpool to Colon	4555	nautical	miles.
Hamburg "	5071	"	"
Gibraltar "	4325	"	"
San Francisco to Panama	3302	"	"
New York to Colon	1926	"	"
Boston "	2077	"	"

The logic of these figures is irresistible. They mean that the Southern ports will have the opportunity to profit more largely in the Central American and South American trade than any other portions of the country. The west coast of South America is undergoing wonderful development. Four transcontinental railroads already connect it with the east coast of that great new continent, and two more lines are in the course of construction. The territory lying between the coasts has been found a rich field for investment by European capitalists, who for the most part are financing the railway construction. Into that vast country the South's products should go.

I understand that the State of North Carolina is today manufacturing all the cotton grown within its borders. Does one pound of this manufactured product leave a North Carolina port for sale in foreign markets? If it does I do not know of it. We are sending from all Southern ports vast quantities of cotton to England to be manufactured there and sent back over the same route to the Orient. This movement adds from 6000 to 7000 miles to its carriage. Our Southern ports might reap the benefit if we had steamship lines trading direct with the Orient. This applies particularly to the Gulf ports, from which the bulk of the cotton is shipped, and which should participate largely in the Oriental trade when the canal is opened. Not only this, but the whole of the trade of the west coast of South America furnishes a rich market for its manufactured products. It undoubtedly has the advantage of the world on natural distances.

The South should realize, too, in considering its shipping possibilities, that it must not waste its natural wealth. It should reach out into the new markets and build up the commerce of its ports, but it should at the same time conserve the resources with which nature has blessed it. Its cotton lands, its timber, its mineral beds and its watercourses should receive protection. The interest of Southern Senators and Congressmen should be awakened in both the upbuilding of our shipping interests, through some form of Governmental aid, and in the protection which the Federal Government can give to our resources.

As president of the Shipping League of Baltimore, and as president of the Conservation Congress, I take the liberty of calling the attention of the people of the South not only to its shipping possibilities, but to the necessity of preventing the extravagant use of its resources. No section of the country is more interested in the preservation of its forests than the South. It should be interested also in the soil wasteage which is constantly going on, due to the fact that we have failed to realize the necessity of preserving the watersheds of our various inland streams. Not alone is our soil wasted, but our rivers and harbors are rendered unfit for navigation on account of the silting that follows. The South is also wasting its splendid opportunities in the development of its water-power.

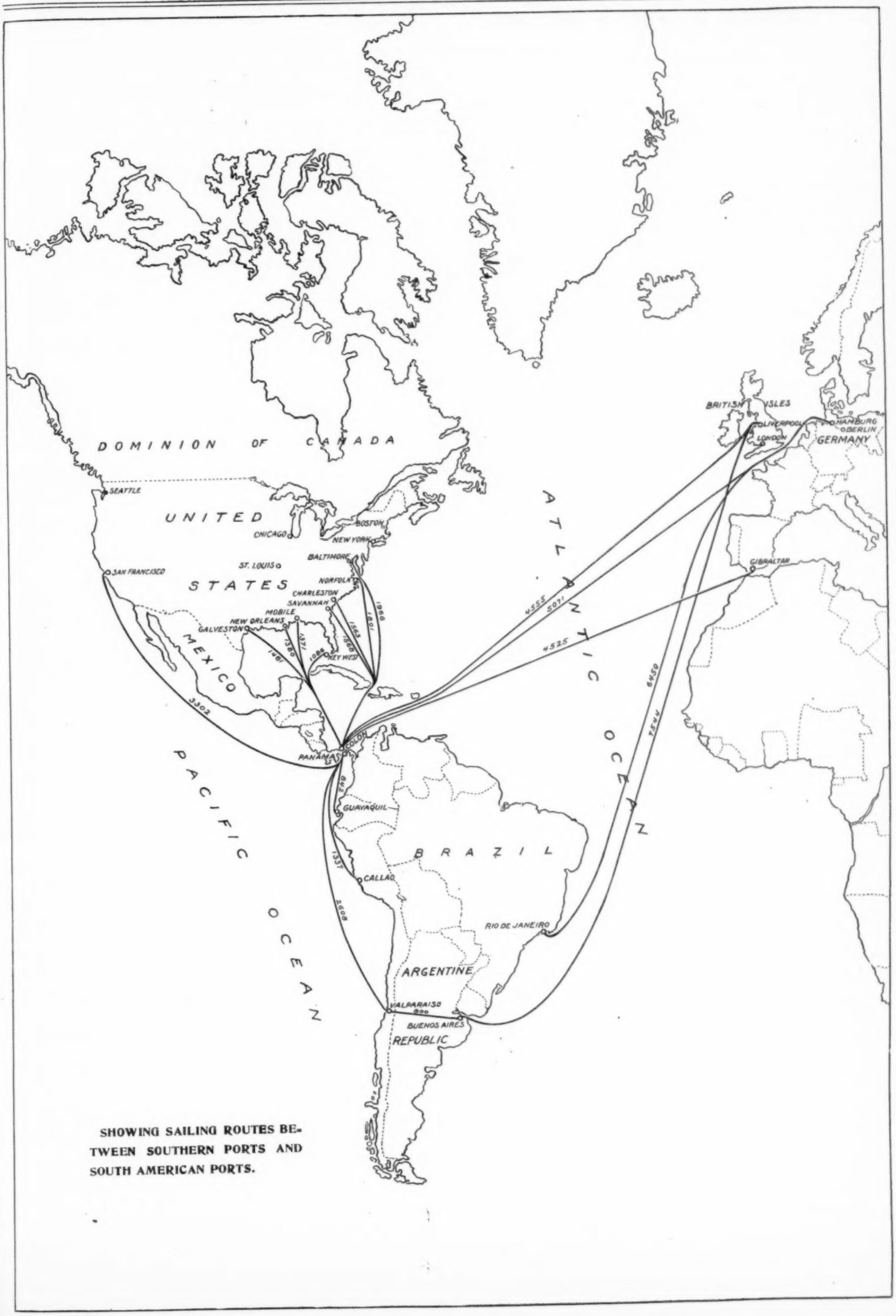
It has been demonstrated conclusively that the South is the only section of the world where large quantities of cotton can be successfully raised. The time may come when the country will, through its waste and extravagance, be forced to import foodstuffs, but whether this comes to pass or not, the South will always possess the great advantage of being able to raise the world's supply of cotton. This cotton will always find a market, and the Southern people will always be able to pay for what it may be necessary to import.

What we want and what the South should be more particularly concerned over is ships to carry away our own products and to bring to our shores such imports as we may need for our use. We want American ships. It is no longer disputed that trade follows the flag. I have seen this demonstrated again and again during my long experience as the president of an over-sea steamship line. The ship carrying the American flag is a floating advertisement of American enterprise and American goods.

The Southern people should urge their representatives in Congress to consider what it means to the Southern industries and Southern resources to have direct steamship lines from the great Southern ports to the west coast of South America, and beyond that to the Orient. It would mean an ever-expanding market for our goods; it would mean wealth for our factories, and it would mean leadership for our seaports. If we digest the situation just as it is, we will see that the North Atlantic coast cannot compete with us through the canal trade, the Pacific coast cannot compete with us, and Europe cannot compete with us. Nature has been generous in giving us the climate, the wealth of our fields and forests and mountains and the superior location with regard to our neighbors near and beyond the equator. It now becomes a matter of enterprise on our part. If we sit supinely by other sections of the country will capture what rightly belongs to us.

There is one very important question which I have never seen discussed, and yet I am satisfied from personal experience that it is the most important one to all the Southern States, and that is, the extension of the frost line through the destruction of our forests. Thirty-two years ago this month I made a long visit in Florida. At Jacksonville and St. Augustine there were large groves of both oranges and lemons. In a visit there last year I was taken as a curiosity to see the small orange grove that was left near St. Augustine. There is none around Jacksonville immediately. I believe this is due entirely to the destruction of the forests in Southern Georgia, Alabama and Northern Florida, and that each year the people will find the frost line moving farther south. The same thing applies to the western sections of North Carolina and South Carolina and Northern Georgia and Alabama. The failure to preserve our Appalachian forest is going to have the same effect as the destruction the pine land has had upon Florida, so that many of the sections now raising large quantities of cotton will be cut off by this circumstance. The destruction of this forest is also going to reduce the flow of the streams to be used for water-power, to result in the silting up of these streams to prevent navigation, and in the expense later of dredging this valuable soil wasteage out of the rivers and harbors. A little foresight now would prevent all of this.

During a visit to Seattle last summer, as president of the Conservation Congress, I had a discussion with some very representative men on our Appalachian forest reserve in the East. There seemed to be a feeling that our Government would not be justified in acquiring this great preserve, as it had to be done by purchase. In the discussion with them I told them that I had never heard in the East any question raised as to the undesirability and disadvantage of spending large sums of money in irrigation, reclamation and forest protection for the West. The fact that it has an advantage over the East in already having the forests of which preserves can be made without purchasing was a great benefit, I pointed out, but that we in the East, as the older-settled portion of our country, were not included in this favorable position, and consequently lands included in the proposed Appalachian reserve were held by interests that should be treated fairly in their purchase. But I did not think the West should begrudge the East the acquiring of this important reserve, even if it did cost some little money. When it was placed in this way before them I found an almost unanimous change of opinion.



SHOWING SAILING ROUTES BETWEEN SOUTHERN PORTS AND SOUTH AMERICAN PORTS.

Commercial Importance of Cottonseed.

By PRESIDENT ANDREW M. SOULE of the State College of Agriculture, Athens, Ga.

[Written for the Manufacturers' Record.]

The rise in value and commercial importance of cottonseed constitutes one of the greatest industrial developments which has characterized the South in the past quarter of a century. It is conceded that one of the first attempts made to crush cottonseed and extract oil and cake therefrom was made at Natchez, Miss., in 1834. This pioneer effort attracted but little attention; for, the industry languished for nearly a third of a century, as there were only about four mills in America in 1867. In 1870 there were some 26 mills, and in 1880, 45. The oil-mill industry made remarkable strides from 1880 to 1890, and a development characterized most aptly by the word phenomenal from 1890 to the present time. The increase in this period has been over 500 per cent., and there are now approximately 800 mills producing oil, cake, hulls and other by-products which characterize this industry. The utilization of the seed has naturally kept pace with the development of the mill business, the per cent. crushed to the total production of seed increasing from 5 to 70 per cent. in a period of 25 to 30 years.

The capital invested in the oil-mill industry represents fully $100,000,000, and gives employment to between 3000 and 4000 salaried employes, besides the 18,000 to 20,000 laborers required to operate the plants and handle the product therefrom. The value of the products is considerably in excess of $100,000,000, and this industry now contributes to the export trade of the country more than $30,000,000 annually. In other words, the once neglected and despised cottonseed now brings in a stream of gold worth this vast sum annually, and if our foreign markets were exploited and the necessary consideration given to the industry by Congress, this sum would be materially increased in the near future.

It is the premise of this paper to show of how much greater value this industry may be made to the South within the next few years if it is managed with intelligence and an effort made to educate the producer as to the economic importance of improving the quality of the seed and then disposing of it to the oil mill, and the consumer to realize what a variety of wholesome materials cottonseed by-products provide for the nourishment and maintenance of the human race at a moderate cost as compared with many foodstuffs now considered essential to the dietary. There are many difficulties in the way of discussing this subject with the proper degree of intelligence and accuracy which is desirable. One of the first and most important is the fact that reliable statistics are exceedingly difficult to secure, and therefore estimates, which are always unsatisfactory, had to be employed to a considerable extent in this discussion. The cottonseed industry has now become so important and the capital invested in it of such large volume that it would seem that those interested should get together and insist upon the Bureau of Statistics giving more attention to this subject and securing accurate data each year for the information of those interested in the manufacture and handling of cottonseed by-products. Up to this time the amount of seed has been determined practically on the basis of cotton "thirding" itself. Such an estimate is bound to be at considerable variance with actual production, for the reason that some varieties of cotton produce 28 per cent. of lint and others as high as 43 per cent. In some instances it may take from 1500 to 1600 pounds of seed cotton to produce a bale; in others, not over 1200 pounds. Since the seed are all necessarily handled through the gins, it would not seem to be a difficult matter to secure the additional data needed to determine the exact production of each year.

That cottonseed and its by-products are rapidly increasing in commercial importance is shown by the following data based on a yield of 11,000,000 bales for the year 1909. There is much question at this time as to just what the yield will be, many contending that it cannot possibly be over 10,500,000 bales, and in that case these figures would be somewhat higher than they should be, though there are many who claim that 75 per cent. of the seed, owing to the high price, have found their way into the hands of the mill man, whereas the figures presented are based on 70 per cent. of the seed being secured by the mills.

With a crop of 11,000,000 bales and cotton "thirding" itself, the seed crop should approximate 5,500,000 tons. If 70 per cent. was crushed, 3,850,000 tons were used by the oil mills. The price of seed has been unusually high this year, and has probably averaged $22 a ton, though in many localities it has sold for as much as $30 a ton. Figuring the seed on the basis of $22, it represents a cost to the mills of $84,700,000. The amount of seed crushed last year was reported to be 3,670,000 tons, the average cost being $15.57, or a total of $57,141,900. The very substantial advance in the price of seed this year has made a short crop worth much more to the farmers than the larger crop of last year, and indicates the rapid rise in public favor of the by-products of cottonseed, and it is safe to say that in the course of a few years the seed will probably sell to the mills readily at $30 a ton, and represent a considerable part of the cotton farmers' profit. Even now the seed produced, if all sold to the mills, would represent a sum considerably in excess of the value of one-seventh of the lint produced.

Granting that 40 gallons or 300 pounds of oil, 813 pounds of meal, 45 pounds of linters and 725 pounds of hulls are obtained from a ton of seed, the by-products obtained from the present crop would be approximately as follows: 154,000,000 gallons of oil, 1,565,025 tons of meal, 173,250,000 pounds of linters and 1,395,625 tons of hulls. It will be observed that there is a waste in manufacture on this basis of 117 pounds per ton of seed crushed; but if statistics are reliable, this is much less than the waste formerly existing, which was put down for the decade 1890 to 1900 at about 161 pounds. The mills now also obtain about 20 pounds more oil than they did 10 years ago, 81 pounds more meal, 5 pounds more linters and 75 pounds less of hulls. A corresponding change in the proportions of oil, meal and hulls may be expected in the next 10 years as the machinery in use is perfected by invention and the management becomes more proficient in its operation.

The value of the by-products is somewhat problematical, owing to the wide variation in price which they have commanded at various seasons of the year. The crude oil market opened at from 23 to 27 cents per gallon, and has reached the unprecedented high level of 47 cents; the average for the season will probably not be far short of 36 cents. Meal has sold for some time at $30 a ton, but much of it was contracted at a figure which will make the average received for the product probably not over $27 per ton. The linters are worth approximately 1.5 cents a pound, and the hulls about 40 cents a hundred, or $8 per ton. The figures for oil and meal are considerably lower than they would have been had there not been much advance selling of these products by the mills during the summer and early fall before it was realized how short the cotton crop was likely to be.

The above figures have been used in determining the approximate value for the by-products for 1909. On this basis the crude oil was worth $55,444,000; the meal, $42,255,675; the hulls, $11,165,000, and the linters, $2,598,750. This makes a total of $111,439,425, and marks the first substantial advance in the value of cottonseed by-products beyond the $100,000,000 mark. According to bulletin 100 of the Department of Commerce and Labor, the products of 1908 were worth approximately $86,092,583, of which oil contributed about $44,094,511; meal and cake, $33,576,662; hulls, $6,079,623, and linters, $2,341,787. These figures show the ever-increasing recognition which the by-products of cottonseed are commanding. Meal sold a few years ago at $11 to $15 a ton, and though the amount available has been greatly increased since that date, the supply is limited in proportion to the demand at $27 per ton. The same is true of oil, the high level for the crude product having been reached this year.

That this industry is destined to play a much more important part in the future industrial development of the South than it has in the past is illustrated by the following figures: At present approximately 70 per cent. of the seed is crushed. Suppose all were crushed; then 220,000,000 gallons of crude oil would have been produced, 2,235,750 tons of meal, 1,993,750 tons of hulls and 247,500,000 pounds of linters. The probabilities are that the value of the products will increase very considerably as the years go by, but with the figures already used the oil would represent a value of about $79,200,000; the meal, $60,365,250; the hulls, $15,950,000, and the linters, $3,712,500, or a total of $159,227,750. If there is any substantial increase in value in the next 10 to 20 years, and with the larger production of cotton which will be necessitated to supply a proportion of the world's demand, it is not unreasonable to expect that cottonseed by-products will be worth approximately $200,000,000 to the South. It is true that the figures presented utilize the entire crop of the year, and therefore leave no seed for planting, but as the yield this year is considerably below what it has been for a number of years past, there is no reason why, when the farmer is educated to understand that it is better policy for him to sell his seed in exchange for meal, at least 5,500,000 tons of seed should not be available for crushing within a very short period of time. With approximately 800 mills available, each one would have to handle 6888.8 tons when 5,500,000 tons of seed are utilized. As a matter of fact, the average crush of 1908 was 4547 tons. It is probable, however, that many of the mills were not operated up to their full capacity. The chances are also that when the crush becomes as large as has been suggested that 1000 to 1100 mills will be in practical operation, and this will materially increase the capital invested and the number of persons who will secure remunerative employment from the industry. The development of this business also insures much more freight for the railroads to handle and a distinct increase in the returns from goods exported over that obtained at the present time.

There is every reason to feel, therefor, that the cottonseed by-product industry is still in its infancy, and this is particularly true when certain phases of the subject are considered, which have up to this time been neglected or overlooked. For instance, certain data indicate that a ton of seed may not contain over 28 to 30 gallons of oil, whereas another ton, produced under quite similar soil and climatic conditions, may approximate 56 to 60 gallons. No attempt has been made to produce strains of seed yielding a high content of oil or nitrogen up to this time, yet this promises to be a most fertile and attractive phase of cotton industry and one destined to revolutionize the business. It has been shown that the content of oil from sugar beets may be substantially increased. It is equally true that the nitrogen content of the seed may also be increased. The time will come, therefore, when the yield of oil obtained from the seed will approximate 45, and even 50 gallons to the ton. If the total crop of 1909 were crushed and yielded 50 gallons of oil per ton, the output would have been 275,000,000 gallons, which, at 36 cents a gallon, would represent a value of about $96,000,000, or more than the cottonseed by-product business has aggregated in any year prior to 1909. While this date may be somewhat distant, and some may be inclined to look upon the suggestion as visionary, there is an abundance of scientific data available to show that the contention is founded on fact, and that all that is needed is to educate the farmer and to set our Southern people to work systematically to improve the cottonseed through breeding for higher yields of oil and nitrogen.

There is another direction in which we need education, and that is on the part of the farmers who persist in retaining 30 to 40 per cent. of the seed produced at home and using it directly as either feed or fertilizer under the mistaken notion that they are enriching the soil materially by this practice. As a matter of fact, cottonseed oil is a carbohydrate; that is, it consists of carbon, hydrogen and oxygen—materials which the plant obtains directly or indirectly from the air, and which represents no drain on soil fertility whatever, nor does the addition of this oil to the soil through the medium of seed used as fertilizer serve the crop grown thereon in any respect. It is simply an aggravated example of an unjustifiable waste persisted in through a misconception of what constitutes the important fertilizing principles of the seed and the more or less vague feeling that the oil mill is securing a material advantage over the farmer when it secures his seed.

A ton of seed contains but half as much fertility as a ton of meal. Experiments have indicated that 900 pounds of high-grade meal are equivalent to a ton of seed in fertilizing value. The seed cannot be fed with satisfaction to some classes of live-stock, and certainly not in the same amount or with the degree of safety with which the meal can be utilized. The seed is not nearly as valuable for fertilizer as the meal, which is naturally more concentrated. Under the circumstances, therefore, the farmer has nothing to gain by retaining the seed on the farm, provided he can make a satisfactory trade with the oil mill. Suppose the farmer has four tons of seed and can secure $30 a ton for the same. He can exchange a ton of seed for a ton of meal, and in some instances was offered additional remuneration during the present season. Two tons of meal possess the fertilizing, and we think practically the feeding equivalent, of four tons of seed. The farmer could therefore put $60 in his pocket and still have as much material for the proper nutrition of his live-stock and the fertilization of his land as if he had retained the seed at home and denied commerce and the people of the world the privilege of utilizing and enjoying the 160 gallons of oil and other by-products derived from the seed. Education along this line is very much needed, and will do much to stimulate the sale of seed to the oil mills. Of course, the mill man should realize that he must be fair and just to the farmer in the exchange offered. This has not always been the case, and accounts in part for some of the prejudices existing, and which can be remedied

by fair dealing or the part of all those interested in preventing the inexcusable waste which results from utilizing seed directly as fertilizer.

On the basis of this year's crop at least 1,000,000 tons of seed will be withheld from the channels of commerce, representing a waste of more than 40,000,000 gallons of oil, worth approximately $14,500,000. In a season when the crop approximates 13,000,000 to 14,000,000 bales the loss will be from two to three times as great. The agricultural colleges are making an effort to reach the farmer and correct such mistakes and practices as this through extensive teaching. It would seem as though every State Legislature and every interest in the South might appropriately combine in an effort to secure adequate support for these institutes, in order that they may assist in disseminating information which will correct such an enormous and needless waste.

Similarly, attention should be directed at this time to the frightful waste of cottonseed meal which is going on in this country from its being used almost exclusively as fertilizer when it should first be fed. It has been pointed out over and over again that cottonseed meal is worth at least $25 to $30 a ton as a foodstuff, and certainly as much more as a fertilizer. Under the best management it should be worth $60 a ton. We have seen that it is sold probably at $27 a ton, and this represents the potential value we are securing from it now. The waste due to a failure to utilize cottonseed meal as a foodstuff is quite as appalling as from the misuse of the seed.

In this connection it should be pointed out that cottonseed by-products are finding new uses every day, and that this is likely to continue for some time to come. Experiments are being conducted to determine ways and means by which the oil may be deodorized, and some of these promise to yield success at an early date. Undoubtedly, methods of causing cottonseed oil to dry quickly will be found in the next few years, and when these two ends are obtained the oil will be as useful and desirable for paint stock as linseed oil, and as valuable for dietary purposes as olive oil. This means a much wider use for an edible product the quality of which is above reproach.

THE SOUTH, THE NATION'S GREATEST ASSET.

By CLARK HOWELL, Editor Atlanta *Constitution*.

[Written for the Manufacturers' Record.]

Let us lay aside, once and forever, the note of provincialism or of sectional sufficiency when we discuss the status and the outlook of the Southern States. Let us consider rather the South as standing four-square to the country, the greatest present and potential asset of the nation. From that commanding viewpoint we can support our position with the clearest cut of analysis, relying upon the accepted tests of achievement instead of the narrow pride of insularity.

The South's achievement is phenomenal. Its resources and its future are simply unfathomable. Taking precedence of even these overwhelming factors, one little noted agency needs to be emphasized as of paramount importance in any conclusive summary, and that is—

The political, as well as the merely physical, reunion of the South with the nation; the demanding by the South of an effective voice in the nation's affairs; the disappearance of the obsolete idea that the South is a pocketed and secluded political borough, whose action upon vital national issues may be discounted with mathematical assurance, and whose intellectual and political activities are limited by a blend compounded equally of traditional fetich and intolerance.

That day for which progressive Southern leaders and not always disinterested Republican Presidents have prayed long and with ardor is already at hand. The South, the white South, is on the eve of an emancipation freighted with as pregnant importance to its people, its commerce and its industries as was that historic proclamation of Lincoln to the negro slaves of the South.

The Lincoln proclamation struck off physical fetters only, leaving helplessness and ignorance and incapacity to a crippled race without crutches.

The proclamation of a later day, proceeding from the intelligence and the intuition of an awakened people, strikes from the thought, the initiative, the self-respect and the energies of the white South the shackles of political isolation, of suppressed convictions, of muzzled thought and censored speech.

Today men rise in the South and speak candidly their minds, whether or not it chimes with current sentiment. No longer are they ostracised or criticised for saying that which they believe. Tolerance and liberality are the keynotes; breadth and sincerity the text. Time and laws and sentiment irrevocably written have laid forever the black specter that once made compromise compulsory. We have been renationalized, and that of our own volition. We have won, from circumstances and from ourselves, the right to participate again unhampered in national councils.

This does not necessarily mean that the political alignment of the South will undergo readjustment. It does not mean that Southern men are no longer under the lash of coercion, and that the political course to which they henceforth address their efforts will be the product of conviction and not of expediency.

These appear queer sentiments with which to preface a summary of Southern resources and advantages. As a matter of fact, they are the pith of relevance, since up to this time it has been the South's isolation from the nation, the nation's isolation from the South, that have kept the one from its legitimate development and the other from reaping the advantages of that development. Now the weight has lifted; a factor that previous Southern estimates of the South have ignored and that must now be considered in making up a symmetrical story.

Thus material and intellectual evolution, for the first time since the Civil War, have right of way in the Southern States. Their stimulating influence upon that destiny which prefigures the South as the wealthiest and most virile portion of the nation is inconceivable.

The other sections of the country, including the pre-eminent East, have waxed wealthy and overshadowing because of four great developed assets and influences:

1. Agriculture. 2. Manufacturing. 3. Mining. 4. Commerce.

The South today faces America with all four of these factors in a tremendously flourishing condition, but merely in their infancy.

What shall we not accomplish tomorrow?

In the neighborhood of $1,000,000,000 will be brought into the South this year by its cotton crop alone.

The effect in Georgia only is not less than astonishing. A few days ago the Atlanta *Constitution* estimated that as the result of difference between low-priced and justly-priced cotton, the State banks have deposited to the credit of Georgia farmers something like $100,000,000. This is not to reckon with the national banks. The sum here estimated represents an increase over last year of approximately 100 per cent.

The condition of Georgia is exceptional, for the reason that her large crop is getting the advantage of short crops elsewhere. But in every other State of the central South there obtains a situation parallel to that effective in Georgia, the dimensions but slightly altered by changed local details.

For four years there has been a succession of cotton crops sold at reasonable, and not starvation prices. The cumulative effect of this fact is almost immeasurable. It is an infallible portent of the future in a single direction.

Today, as a consequence, the old specter of rural indebtedness has vanished, or is vanishing. Everywhere are the symbols of prosperity and a contentment only leavened by a vigorous initiative for the future.

It is logical to believe, too, that we have seen the last of low-priced cotton. The growth of the world's population, the inevitable expansion of commerce, make conservative that assertion. And, in turn, this means that henceforth the South and those who cast their lot with our lot may with safety rely upon a stable, increasing and unshakable source each year of large cash revenue.

This merely begins the agricultural story of the South. The Western States pin their faith upon wheat and grain. Without them their industries crumble like a house of cards. To the central world-wide monopoly of cotton the South adds also corn and wheat and cattle-producing possibilities almost rivalling those of the West.

Now, we produce a reproachful smattering only of our personal needs in this direction. Tomorrow comes readjustment. Who can foreshadow the full harvest in dollars and growth of population?

Legitimately and inevitably, the South is the world's center for the manufacture of cotton goods. Already we have recorded magical progress, wresting from New England supremacy in the field of coarse weaves. Day by day we are encroaching into the field of fine weaves. Logic and circumstance decree the day when the bulk of the cotton crop goes forth as finished cloth to the world's markets. How will the publicist of the future estimate the South's wealth, when to it is added largely the wealth of the looms and spindles of Old and New England?

Other lines of manufacturing have grown with phenomenal stride, though they, too, are only in their first chapters. For virtually every manufacturing industry that has risen to productiveness in the East we have a duplicate here in crude material. In time we will have the skilled labor. Our training and technological schools are getting ready to take care of that.

We have, too, an incalculable abundance of power, whether it comes from cheap steam coal or from water-power, nine-tenths of which is yet to be developed.

The Birmingham district in Alabama has enough of mining and manufacturing promise to threaten the supremacy of Pittsburg. The iron and steel there wrought will not only furnish material for the corollary manufactures of the South, but will also lay enormous tribute on the remainder of the country and the remainder of the world.

Granites and marbles and limestones and cements in great and untouched stores comprise another great source of developed and potential Southern wealth. Clays and slate and bauxite and other basic minerals that dominate commerce are distributed throughout the section in generous volume and easily accessible.

Inseparably interwoven with these tangible assets in their producing and their dormant state is the tremendous essential of commerce and commercial acumen, ability and breadth of outlook.

We used to mourn the decadence of Southern traditions and the intruding of "commercialism" and that militant spirit of the twentieth century that timed its energies and shaped its course to the needs of the hour.

We have ceased this futile and ungrateful practice. We see, in the light of achievement won and to be won, that we have not sacrificed one whit of those traditions which deserved to survive; that our moral cleanliness, our code of honor, our political virility and our proverbial courtesy are still with us, conceding nothing to the modern conception of performance.

But to these elemental and softening qualities we have added briskness in barter and trade, a due recognition of the worth of the gifts showered upon us by Providence, an adequate realization of their value to the world, and with it our duty of material development, a duty owing even more to our children than to ourselves.

That is the commercial instinct of the New South, though to use the term "New South" is to invoke platitude.

It is because they are, unconsciously and by association and necessity, trained in this school that the business men of the South are developing that depth and breadth of brain characteristic of the old school of Southern statesmen when the South dominated America. They have, through stress, become competent to handle the commercial problems of the nation's most overshadowing section. It is that fact which needs to be understood in the marvelous advancement of our people and of the larger future just over the horizon.

Recently the Southern people have manifested in two directions an initiative that is powerfully indicative of an awake and aggressive public sentiment the like of which has been exactly duplicated in no other portion of the country.

Virtually, as a section, the South has placed its emphatic approval upon the vital issue of good roads; and—

Virtually, as a section, the South has repudiated demagoguery and wild-cat-ism in politics.

Here and there other States in the Union have inaugurated campaigns looking toward systematic highway improvement. The South has done and is doing that as a section. The most striking exemplification of this far-seeing business instinct is, perhaps, seen in Georgia; but it is impossible to name any other Southern State that is without its well-defined and restless movement aimed at increasing values by increasing transportation facilities.

Just now the demagogue and political charlatan are not popular in the Southern States.

State after State has read to each a stinging rebuke, either retiring them to innocuous private life or jolting them with a warning that has injected sanity and moderation into their philosophy.

This does not mean that the South is laying itself open to unscrupulous and tyrannical capital. But it does mean that, exacting a rigid observance of the dictates of justice and fair dealing, the South has again opened its gates to investment, insuring

custodians of capital they will be protected in their rights and allowed ample margin for legitimate profits and improvements.

Nothing is more significant in the present and future material progress of the Southern States than the establishment of this bedrock principle. For it were, indeed, useless to have here the crude wealth of an unestimated El Dorado so long as we did not leash the destructionist and the class agitator.

In casual style and only in the higher lights, these sentences epitomize what the South has accomplished and what it is going to accomplish, a certainty that is underwritten by natural and human forces with which every man possessing only a speaking acquaintance with us is confessedly familiar.

Supported by these solid portents of an independence regained and a prosperity securely anchored, the South faces the new year and the years beyond with eager and joyous confidence.

We have here an imperial heritage more versatile and more productive than that bleak Canada which annually summons 75,000 sturdy American immigrants. We are pleading with the Southern railroads and the Southern people to rouse from their lethargy and bring these roving Westerners and Easterners down to an empire of the richness of which they have not even been informed.

It is in the unfulfilled development of the South that the ultimate destiny of the nation may be most plainly seen, and to its realization we invite the nation.

NATIONAL RIVERS AND HARBORS CONGRESS.

By PRESIDENT JOSEPH E. RANSDELL, Congressman from Louisiana.

[Written for the Manufacturers' Record.]

It is no exaggeration to say that the convention of the National Rivers and Harbors Congress at Washington on the 8th, 9th and 10th of December last was the most remarkable assemblage in many respects that ever convened in America. Men of every shade of thought, political and religious belief, interest, avocation and locality were present, and all were actuated by the patriotic purpose to cheapen transportation by the wise improvement and use of the nation's waterways. Representatives were there from every important watercourse adjacent to the Atlantic and Pacific oceans and the Gulf of Mexico, from the region of the Great Lakes and from the mighty rivers that flow through the Mississippi Valley to the sea, and while everyone was loyal to some particular project, no voice was raised except in advocacy of a broad, liberal, comprehensive and effective policy for the prompt improvement of every worthy watercourse in the republic. This sentiment was the ruling note of President Taft's speech, and every other speaker reiterated and emphasized it.

The German Ambassador, Count Bernstorff, read a learned paper on the waterways of his fatherland. He showed that Germany has for years been engaged in the systematic improvement of its waters, connecting them by artificial canals, standardizing them as nearly as possible, providing ample and efficient public terminals thereon, protecting them from unfair rail competition, making of them a potent factor in the empire's transportation system and deriving from them the most beneficial results. He convinced his hearers that we should follow the wise example of Germany in this respect, and I earnestly hope we will.

The resolutions, adopted without a dissenting voice or one discordant word, were dignified and patriotic in the extreme. I cannot do better than quote freely from them:

"1. The National Rivers and Harbors Congress includes in this convention 3150 accredited delegates—farmers, manufacturers, merchants, maritime and professional men and members of commercial bodies—representing the greater part of the tonnage of the United States, as well as the shipping interests of the country at large.

"2. This congress is assembled to urge upon the Government of the United States the immediate adoption of a broad, liberal, comprehensive and effective policy of rivers and harbors improvements.

"3. Every commercial country in the world is working to better its transportation methods, knowing that upon easy, cheap and sufficient transportation depends the material prosperity of its people, and knowing that to the country which first perfects its system of transportation will come the commercial supremacy of the world.

"4. Every foreign country is utilizing its rivers and harbors and other waterways as the chief factors in perfecting its system of transportation, and the Government of every foreign commercial country has deliberately assumed the responsibility of making its rivers and harbors and other waterways adequate for all transportation purposes.

"5. The United States, with resources and courage great enough to undertake successfully the building of that gigantic and most useful water highway, the Panama Canal, controlling its own navigable waterways to the exclusion of private effort, is alone among the world Powers in neglecting the improvement of its waterways, and has so failed to develop them into effective freight-carrying navigability that the inadequate transportation facilities now seriously impair our commercial growth and cause enormous waste of our agricultural resources, retarding the settlement of the country and hindering its productive development.

"6. Unless these transportation facilities be made sufficient the United States cannot hope either to increase its domestic commerce or extend its foreign commerce, as it should, or to take advantage of the opening of the Panama Canal in order to compete with other commercial countries in the markets of the world. This Government has the power to give the United States absolute commercial supremacy over all other countries, and the Sixty-first Congress, now in session, can do much to accomplish this by appropriate legislation."

Continuing, these resolutions declare in favor of a rivers and harbors bill at this session of Congress carrying at least $50,000,000 and a like bill *annually for the next 10 years;* for the immediate adoption and placing under continuing contract of such projects as have been approved by the Engineer Corps and will form a part of the comprehensive system to be hereafter adopted; for ample financial provision to carry out this system, "such moneys to be paid from current revenues when practicable or from an issuance of bonds when necessary;" for the creation of a Department of Public Works, with a Cabinet officer at its head, to have control of river and harbor work and others of similar character, and finally they say:

"In order to fully secure the benefits of waterway improvement to the shippers of the country it is absolutely necessary that the harbors, lakes and rivers should have the most modern terminal systems for the vessels. We earnestly urge upon the people of States and cities where waterway improvement is proceeding the importance of establishing public terminals and landing places, with the most modern appliances and equipment for loading and unloading freight and of beginning the work immediately."

While the resolutions made no suggestion about regulating railroads, the subject was discussed by several speakers, and it was thought by many that the matter should be called strongly to the attention of Congress. One of the best authorities on transportation in the country suggested that the resolutions embody a recommendation that the Interstate Commerce Commission be given the power to establish a joint rate and through route between rail and water carriers against the will of either the water carrier or the rail carrier; also providing against the absoption of water lines by competing rail lines; and prohibiting agreements as to rates between competing water and rail lines; also giving the commission authority to fix a minimum rate below which a rail carrier shall not be allowed to go in competing with the water carrier when necessary to prevent unfair and unreasonable competition upon the part of the rail carrier. While all recognized the wisdom of these suggestions and the necessity of their enactments before the full benefits of water transportation can be realized, it was thought best not to include them in the resolutions. I hope all friends of waterways will give this matter their very careful consideration and aid in solving this most difficult question. It is unfortunate that there is not *co-operation* instead of *competition* between water and rail, and we must do our utmost to bring this about either by force of enlightened public opinion or by law. It would be much wiser for the railroads to co-operate with the waterways, as the best paying roads in the Union are those adjacent to well-improved waters, such, for instance, as Long Island Sound, the Hudson River and Erie Canal and the Great Lakes. Whenever navigation is good and the waters are utilized to transport heavy, bulky, low-class articles there is invariably an increase of population and manufactured articles, which give to the railroad a large amount of high-class, profitable business, and it is benefited rather than injured by friendly water competition.

There has been a marvelous growth of sentiment in favor of waterways during the past four years. Many people are now studying and understanding the subject who gave no heed whatsoever to it five years ago, and hence did not realize that water transportation is not only much cheaper than that by rail, but actually much quicker for low-class commodities. They did not appreciate the fact that a well-improved waterway system would prevent such freight congestion as existed and caused so much loss three years ago, and they failed to comprehend that a well-improved river or canal adjacent to a railroad would be the best of all rate regulators. These ideas have now taken root, and we expect a marked advance in water legislation during the present session of Congress. We hope to see many of the larger projects previously surveyed and approved by the United States Corps of Engineers, and found to be thoroughly worthy of improvement, placed under continuing contract and financial provision made so that they may be completed within the next 10 years. We also hope to see a definite declaration that hereafter river and harbor bills are to be passed annually, and in that respect placed on a par with the other great appropriation bills.

The general sentiment among waterway people is that bonds should be authorized to pay for waterway improvements *whenever current revenues do not suffice.* They care nothing about bonds, but they are earnest about improving the waterways without further delay, and advocate bonds because they fear a dearth of current revenue. Some insist that there should be no special bonds for waterways, but that improvements thereon should be carried along with other Government expenditures, and if a general deficit arises bonds should be issued to cover same. I do not, however, assent to this argument. It is not only defensible, but good statesmanship to issue bonds for great, permanent public works which will benefit not only the present, but all future ages, such as excavating the granite rock from Boston harbor; constructing locks and dams of concrete and steel on the Ohio, the upper Mississippi, the Columbia, the Trinity, the Ouachita, the Black Warrior, the Coosa, the Tennessee, the Cumberland and many others; making permanent revetment works of willow and stone on the Missouri and the Mississippi; digging canals across Cape Cod, between the Hudson River and the Delaware, between Delaware Bay and the Chesapeake, between Norfolk and Beaufort's Inlet, and between the Mississippi and the Rio Grande.

No great permanent improvements are ever made either by individuals or corporations, and rarely by States, without incurring debt therefor. Nearly all of our great railroads were built on credit. The present bonded indebtedness of the railroads is over $8,500,000,000—more than nine times as much as our total national debt. We are issuing $375,000,000 of bonds for the Panama Canal, and the improvement of our internal waters is vastly more important than that great and most worthy enterprise. The Empire State of New York is issuing $101,000,000 of bonds to deepen the Erie Canal and an additional $50,000,000 of bonds for her highways; the State of Illinois has authorized $20,000,000 of bonds to aid in canalizing the Des Plaines and Illinois rivers so as to give navigation between Lake Michigan and the Gulf of Mexico, and nearly every State and municipality in the Union has issued bonds for some kind of public improvement to benefit the present and the future. But expenditures by Congress for current, temporary purposes, such as appropriations for the Postoffice Department, pensions, the army, the navy and salaries of various officials, etc., are of an entirely different character and should be made out of current revenues. It follows, therefore, that while a bond issue for permanent waterways can be easily defended, a general bond issue for general purposes of Government would be subject to just criticism.

In conclusion, we are entitled to the best transportation system on earth, and, while we lead in railroads, we are sadly behind in improved waterways. Every community in the Union, whether located on a watercourse or many miles in the interior, will be greatly benefited, directly or indirectly, when our general waterway system is an accomplished fact, and all should assist in securing it. I appeal to every lover of his country to aid in carrying out this great policy.

Southern Hydro-Electric Power Development.

By WADE H. HARRIS, Editor the *Evening Chronicle*, Charlotte, N. C.

[Written for the Manufacturers' Record.]

The history of the electrical development in the South is not only an interesting one, but it is an amazing one. Before going into details it might be well to present, in a general way, a story of this development, a development that has been of comparatively recent origin, but that has made tremendous strides. It was in a conversation with Mr. J. W. Fraser, assistant engineer of the Southern Power Co., that this story for the MANUFACTURERS' RECORD was brought out. Mr. Fraser gives three reasons for the phenomenal growth of the electrical development in the South. One is the improvement in transformers; the second is the fact that there was a market for power in the cotton-textile industry; the third is that water-powers could be developed at a cost that made competition with steam power possible.

A DETAIL OF DAM CONSTRUCTION AT BLEWETT'S FALLS.

In elucidating these propositions Mr. Fraser went on to say that we are all so familiar with high voltage today that we are liable to overlook what the pioneers in transformer design did for us by improving the insulation and general design of transformers. Without high voltage the amount of copper that would be necessary in transmission lines would prohibit transmission of power to any great distance, and consequently the large water-powers that could be developed at a reasonable price per horse-power would still not be available without the transformer.

The first textile mill in the world to be equipped throughout with electric drive only used 570 volts. The distance of transmission in this case was only 800 feet. The limit of economical transmission at this voltage under ordinary conditions in the South will be three times this distance; so it is easily seen that we are dependent upon the transformer designer for economical transmission of power to mills scattered over large areas.

It is worthy of note that the mill referred to was the Columbia Cotton Mills, Columbia, S. C. They commenced operation on June 27, 1894.

The next marked advance in electrical transmission in the South was made by the Anderson Water, Light & Power Co. of Anderson, S. C., when it began the transmission of 175 horse-power at 5500 volts in the latter part of 1895. Three years later this company developed Portman Shoals, on the Seneca River, transmitting 1200 kilowatts to Anderson, a distance of 10 miles, at 11,000 volts. This company holds the honor of putting in operation the first 11,000-volt generator ever used in commercial service.

PRESENT CONDITION OF DAM AT BLEWETT'S FALLS.

This voltage for several years was considered as high as it was practical to use, but as soon we heard of 22,000-volt transformers, and a year or two later of 33,000 and 44,000, and about the year of 1902 the Missouri River Power Co. put a line in service successfully at 50,000 volts.

In the South what may be considered the next step was made in the increased size of the developments. This credit is due to the Catawba Power Co. A 10,000-horse-power plant was built at India Hook Shoals, near Rock Hill, S. C., and 10,000 volts was considered an economical electro-motor force for distributing this power to the nearby towns. The demand for this power was so great that those interested in the Catawba Power Co. formed a larger organization, known as the Southern Power Co., with the intention of distributing power to all the mills within economical transmitting distance of certain water-powers on the Catawba River which could be developed at a reasonable cost.

The matter of voltage referred to above was one of the questions which received the most careful attention of the engineers, and it was decided that 50,000 volts was the most favorable to the existing conditions, and would permit of the economical transmision to sufficient mills to take care of all the power that could be developed for several years. Although the plant referred to above was operating at 50,000 volts, some of the most prominent engineers in the country were not in favor of using such a high voltage. The hundred and more mills operated from the 50,000-volt lines of the Southern Power Co. go to show that its system is a success. This system stands out as a notable example of distribution over a large area as compared with the many other systems throughout this country which transmit from one or more plants to some central distributing point.

The Southern Power Co. transmits power from several generating stations to forty-odd towns, where in almost every case this power is sold in bulk to mills and to local power companies for local distribution. When the limit of distribution at 50,000 volts had been reached by this company such further improvement in the insulation of transformers and in the design and insulation of transmission lines had been made that the company decided to use 100,000 volts for distributing to the towns lying beyond the 50,000-volt radius and for reinforcing the 50,000-volt system. Today power is supplied at Greensboro on the north, Greenville on the south and to intermediate towns from a 100,000-volt distributing system.

The South again should take credit for pioneer work, for although one short line had been put in service at 100,000 volts in the Northwest, it remained for the Southern Power Co. to develop a 100,000-volt distributing system as sure an operation as a 50,000-volt system. In the above case referred to both the step-up and step-down transformers are connected directly to the line without switching apparatus, but the Southern Power Co. transmits and distributes 150 miles in one direction and about 100 miles in another, and switches at various points the same as it does on its 50,000-volt service, with which it is tied in through step-down transformers, composing as indicated a high-tension transmission and distributing system of over 800 miles in extent, as opposed to a simple transmission system.

DETAILS OF POWER-HOUSE UNDER CONSTRUCTION AT BLEWETT'S FALLS.

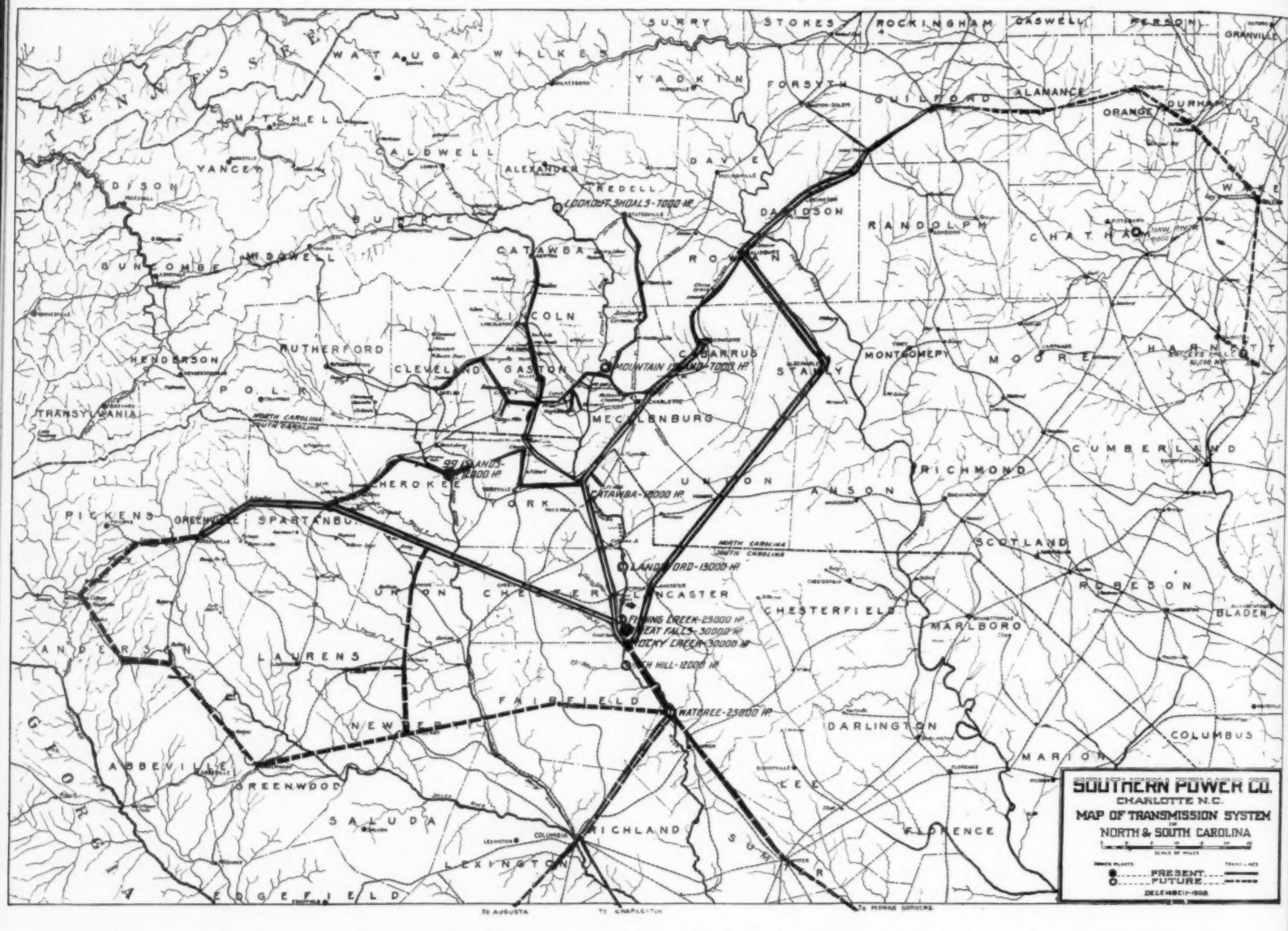
Between 7,000,000 and 8,000,000 pounds of steel and nearly 2,000,000 pounds of copper have been used in the last year in the building of these lines, and over a dozen substations are now in service, aggregating over 100,000 kilowatts in transformers, supplying power to the various mills, etc., in their vicinity. In addition to the above, there will be completed by early spring over 200 miles of 50,000 and 100,000-volt line.

Coming down to details, the following is a list of the hydro-electric developments completed by the fall of 1906, with their horse-power at that time:

Name.	Location.	H. P.
Columbia Cotton Mills	Columbia, S. C.	4,000
Anderson Water, Light & Power Co.	Anderson, S. C.	5,000
Pelzer Manufacturing Co.	Saluda River, Pelzer, S. C.	5,000
Fries Manufacturing & Power Co.	Yadkin River, Winston-Salem, N. C.	1,000
Montgomery Water-Power Co.	Tallassee Falls, Tallapoosa River, nine miles from Milestead	7,500
Atlanta Water-Power Co.	Morgan Falls, Ga., Chattahoochee River, 18 miles from Atlanta	15,000
Columbus Power Co.	Chattahoochee River, Columbus, Ga.	7,000
Weaver Power Co.	French Broad River, near Asheville, N. C.	2,000
North Georgia Electric Co.	Chattahoochee River, Gainesville, Ga.	4,000
Union Power & Manufacturing Co.	Broad River, near Union, S. C.	7,000
Catawba Power Co.	Catawba River, near Rock Hill, S. C.	10,000
Dan River Power & Manufacturing Co.	Dan River, near Danville, Va.	4,000
Belton Power Co.	Saluda River, near Pelzer	4,000
Ware Shoals Development	Saluda River, near Greenwood	3,000
Virginia Passenger & Power Co.	James River, near Richmond	10,000

This has been increased since that time by the following:

Name.	Location.	H. P.
Southern Power Co.	Catawba River, Great Falls, S. C.	32,000
Southern Power Co.	Rocky Creek, S. C.	32,000
Southern Power Co.	Broad River, 99 Islands	24,000
Montgomery Water-Power Co.		
Electric Manufacturing & Power Co.	Gaston Shoals, near Gaffney, S. C.	6,000
Greenville-Carolina Power Co.	Near Greenville, S. C.	2,500
Savannah River Power Co.	Savannah River, near crossing S. A. L. Railway	3,000
Buckhorn Shoals	Cape Fear River, near Sanford, N. C.	5,000



Possibly there may be a few other smaller plants. In addition, these are under construction:

Name.	Location.	H. P.
Whitney Power Co.	Yadkin River, near Albemarle, N. C.	40,000
Rockingham Power Co.	Yadkin River, near Rockingham, N. C.	40,000
Central of Georgia Power Co.		20,000

There are plants amounting to probably over 200,000 horse-power under contemplation, but when they will be developed it is difficult to say. More than three-fourths of this power is being used for running cotton mills, the Southern Power Co. alone having on its 700 miles of high-tension line about 125 cotton mills. The remaining part of this power is taken up by all kinds of manufacturing plants, lights, railways, etc.

In Tennessee there is the Tennessee River & Power Co. at Hale's Bar, 15 miles from Chattanooga, with a development of 40,000 horse-power, and which, with transmission lines, will cost between $4,000,000 or $5,000,000. The Knoxville Power Co. is capitalized at $3,000,000. This plant will develop 32,000 horse-power. Next in importance of the Tennessee developments is the Cany Fork River, near McMinnville, which is expected ultimately to develop 50,000 horse-power.

The amount of money invested in these electric developments within the Southern territory indicated is sufficient to stagger the imagination. The investment of the Southern Power Co. alone is $10,000,000; that of the Blewett's Falls, or Rockingham Power Co., $4,000,000; that of the Whitney Company $5,000,000; the Chattanooga, Knoxville and Cany Fork about $12,000,000. It will all amount in the aggregate to a colossal investment, and will serve to show how the South is forging to the front and the reason for it.

Southern Seaports' Relation to Southern Progress.

By Col. C. P. Goodyear of Brunswick, Ga.

[Written for the Manufacturers' Record.]

The South, with but little more than one-fourth the area of continental United States, has been peculiarly blessed in its coast line and seaports.

Its coast line is safer both on the Atlantic and Gulf coast than any of the remaining coast line of the United States, no mean advantage when a study of ocean disasters shows one-fourth of all of them to be in seeking or leaving harbor.

The total number deep-water seaports in the country with navigable depth of channel exceeding 25 feet is 24. Of these, 12 are upon the Southern Gulf and Atlantic coast.

Of other ports which may be deepened to this extent the South still has one-half.

The advantages of Southern seaports other than in depth and number is the freedom from ice and snow blockades in either rail or water approach.

Lower grades for railroads than at other ports of the country are also an important consideration.

The South already has through her ports more than one-third of the entire export business of the country.

She is yet weak, but is steadily growing in the handling of imports.

The Southern seaports are terminals for 67,181 miles of railroads in Southern territory connected with the entire railroad systems of the country.

There has been a tendency to decentralization of freights as at New York. Exports and imports are seeking natural outlets and inlets at home ports.

The great north and south railroads east of the Rocky Mountains are all finding outlets at Southern Gulf and Atlantic seaports.

East and west roads are finding outlets at Atlantic seaports upon the Southern coast.

The wonderful record of growth in the past 29 years in the South has made the South rich enough to ship her own imports direct through Southern ports, instead of paying toll to importers from other great seaports, and she is slowly but surely learning the economy of direct trade.

The distances from the interior of the South from the coal and iron and timber and lumber and other products to Southern seaports far more than compensates the difference against us in ocean distances to Europe, as the ocean rate is far lower than the interior rate.

For the commerce with the West Indies, Central and South America and Mexico the Southern seaports have a vast advantage in distance over any ports of the world, including the home ports of this country. When the Panama Canal is completed, with all Pacific trade.

The trade with South Central American, West India and Central American and Mexican countries is increasing steadily and rapidly with this country.

There is $1,400,000,000 of trade with these countries now controlled by foreign nations ours by right of proximity, and sure to become ours quickly when we adopt proper measures for revival of our merchant marine and turn our attention to this trade with the same energy we have devoted to European trade.

The trade of the Pacific countries with the United States, now but about $400,000,000, will rapidly increase, may double, in a few years. The South American, West Indian, Central and South American and Mexican trade, now about $100,000,000 with the United States, should be and can be doubled. This trade with the country south of us is largely in imports of tropical and semi-tropical products, which has steadily increased yearly until it now reaches nearly $500,000,000 and furnishes an attractive market for our cotton goods and nearly every class of product the South manufactures.

The South is producing a yearly increasing supply of surplus manufactured product for which it must find a market, and the countries south of us are a most attractive field for its sale or exchange.

Yearly there is an increase in the products of the Middle West and Northwest seeking an outlet to the markets of the world through Southern seaports over Southern railroads.

Blest, as the South is, in the number and character of her ports, she is equally

blest in the number and character of her rivers navigable, or susceptible of improvement making them navigable, fully half of such natural means of navigation in the United States, destined to be rapidly improved by the general Government, affording, with our railroads, ample interior transportation to all Southern ports. The railroad construction of the future is destined to be largely in the South, the cost of rights of way and terminals having become mainly prohibitive at the North.

The maintenance of Southern harbor depths is assured at all ports which have been deepened by the National Government.

Since 1840 the growth of foreign commerce with the United States has more than doubled every 20 years.

In 1897 our total foreign trade exceeded $3,300,000,000. There is no reason why this rate of increase should not follow in the next 20 years.

The interior may be built up continuously as conditions demand. Wherever there is human energy sufficient, at every railroad siding, at every river landing, a town may be developed, a center from which transportation may be developed for shipment to the coast.

The seaports God creates. Man may improve, but never create. It is the entrance created by nature and nature's Creator.

Certain harbors of refuge have been created where nature had given part of the work done, but no great commercial seaport has ever been created in all human history by the hand of man.

While the 12 deep-water seaports of the South are ample in channel depth, the tendency of the world's shipping is rapidly to increase draft of vessels. We should steadily press upon the National Government the necessity of increasing depth as draft of vessels increase.

Southern seaports have increased by percentages in both imports and exports in far greater proportion than the increase for other ports of the country. Of the increase, safely by all past experience to be predicted for the next 20 years in all imports and exports, we may safely predict at least complete doubling of the business of Southern seaports in that period.

The terminal facilities at each of the great Southern seaports are steadily improving. There is much, however, to be done in this respect at some of the deep-water seaports. It should be done, and speedily. Every modern facility for loading and unloading vessels should be provided.

The Southern seaports should provide for a vastly increased crop of cotton to be moved. Steadily the increased use of cotton goods will demand an increased crop. It is not a wild estimate to presume that by 20 years from now the demands of the world upon the South will be for from 20,000,000 to 25,000,000 bales of cotton.

Great as is the South's development in iron, steel and their products, the demands of the world will require from the South from three to four times the product of today.

The South is discovering yearly new resources which the world wants. The world is discovering new uses for these resources.

We have quadrupled the export of manufactured goods for the entire country in the past nine years. We shall equal that increase for the next 20 years. We should ship not only a large share of Southern surplus, but also a large share of the surplus of other sections of the country through Southern seaports.

We do not need to wait upon the opening of the Panama Canal for a great increase of business at our seaports of the South.

The South is pre-eminently the section for cattle breeding and meat production. The meat-eating people of the world are rapidly increasing. The increase of population in the always meat-eating peoples increases far more rapidly than the increase in cattle. The South has more native grasses than any section suitable for pasturage. In many sections a fattening ration in cassava and the velvet bean far surpassing corn, far cheaper.

Blizzards in winter and drouths in summer do not kill cattle by thousands.

It is not necessary to keep stock up and feed them from seven to eight months in the year, as in the banner State for cattle-raising, Iowa. From one to two months is ample in the South.

Stock breeding is attracting great attention in the South.

Another source of exports is hay. The South has especial facilities for making a great surplus hay crop for export.

As one who has devoted much time and thought to Southern development I predict, with a confidence growing from a knowledge of the growth of the past 29 years in the South, a growth in the next 20 years so great as to stagger the imagination.

The South had little money in 1880. In 1909 she has over $1,000,000,000 of deposits in her banks.

She had iron in 1880. She manufactures as fine steel as the world can create today.

Shiftless farming has given way to intensive scientific farming.

The world knows the South.

Her seaports, which make a great advancement possible, will reap rich rewards from her growth and prosperity.

CLAYS AND BUILDING STONES OF THE SOUTH.

By ERNEST F. BURCHARD of the United States Geological Survey.

[Written for the Manufacturers' Record.]

In considering the relation of the clay industries to the South a general survey of the situation brings out certain facts which demonstrate that this section of the country affords relatively great opportunities for industries based on clay materials. Without giving detailed figures as to production and value of clay wares at present, the scope and importance of the industry can be perhaps better illustrated by outlining the principal clay wares that are essential to civic, industrial and domestic life. Structural materials include common, front, ornamental, glazed and hollow brick; terra-cotta; roofing tile; fireproofing ware; flues for ventilation, chimneys, etc. In engineering work paving brick, drain tile, sewer brick, sewer pipe and conduits are most essential. In domestic establishments porcelain, earthenware, stoneware and sanitary fixtures, such as sinks, tubs, bowls, etc., are as indispensable as the rest of the household furniture. The industrial world depends largely on refractory wares, such as crucibles, glass pots, tuyeres, fire-brick, refractory blocks for lining cement kilns, furnaces, glass tanks and fireboxes in engines and stoves.

In only one of these lines, viz., structural materials, has the clay industry serious competition, and competition in the building material line has often resulted to its advantage, as, for instance, with the rapid increase of reinforced concrete construction has come an increased demand for brick and terra-cotta for the panels in such buildings. In the same way a large use of cut stone generally calls for a corresponding quantity of brick for backing. With practically no substitutes for the other clay wares mentioned above with the exception of paving brick, the commanding position of the general clay industry can readily be appreciated.

An outline of the important kinds of clay in use and their geologic relations is almost necessary to a full appreciation of the wonderful clay resources of the South. Briefly, then, kaolin, used as a constituent of china clay, is found as a residual or disintegration product of crystalline rocks, such as veins of pegmatite and bands of feldspathic gneiss. These rocks are very old, being generally classed as of pre-Cambrian age. In addition to the purer grades of kaolin, they give rise on weathering to impure residual clays which are suitable for common brick and in places for fire-brick and earthenware. The rocks that produce true kaolin outcrop along the Appalachian axis and Piedmont plateau through Maryland, Virginia, the Carolinas, Tennessee and Georgia, and extend into Alabama, and while important deposits have been developed in most of these States, there is still much territory that is still absolutely unprospected. Above the crystalline rocks in the Southern States lie sedimentary or bedded rocks of Cambrian, Cambro-Ordovician, Ordovician, Silurian, Devonian and Carboniferous age. All these may be grouped together under one term, Paleozoic rocks, and the formations in the various systems of the Paleozoic all contain beds of shale and limestone. These shale beds are often found to be suitable for clay wares, and the clays that are derived from the weathering of the shale and limestone beds are of still greater commercial value. Paleozoic shales and clays occur in the upland regions of Kentucky, Tennessee and neighboring States; in the bluegrass regions of Kentucky, and are spread through Tennessee to Northern Alabama and Northern Georgia. They are found also in Missouri and Arkansas, and are extensively used in the former State as fire-clays and brick shales. The Southern States are, in fact, better supplied with clays that result from rock decay than the territory north of the Ohio and Missouri rivers, because south of the area of glacial drift the surface rocks have been subjected to long-continued decay and disintegration. Erosion has not removed the residual material as fast as it has been formed, consequently the residual clays are of relatively great thickness. In the area occupied by the drift at the North the ice sheet planed away the accumulations of clay, ground it together with rock debris, and on retreating left moraines of sand, gravel and clay, with small lakes between. Silts were deposited on the beds of these lakes, which on evaporation or drainage left the silts as clays. But little of the drift clay occurs in the South. As compared with the residual clay it is more calcareous, and brick burned from it are apt to burn to a cream color rather than to red, which is the characteristic color of most of the Southern residual clays when burned. A third class of clays, which is very extensive, and whose value is only commencing to be realized, comprises the clays of the Coastal Plain. The Coastal Plain deposits contain beds of clay, plastic kaolin, sand, gravel, chalk and some lignite. They are much later in age than the Paleozoic, having been laid down in Cretaceous, Tertiary and recent times. The Coastal Plain extends from the "fall line" or foot of the Piedmont region to the Atlantic and Gulf coast, sweeping from Maryland to the Rio Grande, and extending up the Mississippi Valley to the mouth of Ohio River. Important among the clay formations is the "Tuscaloosa" of the Gulf States and Georgia, and known in Maryland and Virginia as the "Potomac." Pottery clays are produced in several places from this formation, as well as valuable pressed brick. Some of the clay found in the Georgia and Texas Cretaceous and Tertiary formations approach kaolinite in chemical composition, but are highly plastic, and are called "plastic kaolin." One more type of clay common in the South remains to be mentioned, viz., the bluff clay or "Loess" of the Missouri and Mississippi River bluffs. This is a fine-grained, buff-colored, soft, loam material that mantles the uplands and stands in perpendicular cliffs at such well-known points as Kansas City, St. Louis and Natchez. Dry-press brick are made from it at many places on or near the two big rivers, and its quantity is inexhaustible. The Loess is one of the latest of the clays in point of age.

Supplementary to the foregoing general statement regarding the geologic and geographic distribution of clays in the South some specific illustrations may be of interest, but for working details the reader should consult the recent publications on clays issued by the several State geological surveys.

The State of Missouri ranks seventh among the United States as a clay producer. Within Missouri are workable clays ranging from early Paleozoic to the Quaternary Glacial clay and Loess, and in their development this State has set a notable example as to what may be done with such materials. In several counties of Southeast, Central and Southwest Missouri kaolin has been produced. Some has been used locally and some shipped to St. Louis. Some of the ball clays from Jefferson county are reported to have been shipped to East Liverpool, O. Plastic fire-clays are mined and utilized on a large scale at St. Louis, and are found and utilized at many other places in the areas of lower coal measure rocks. Stoneware clays occur in Missouri in four geological formations: (1) In pockets in the Paleozoic limestones in the south half of the State; (2) in beds in the coal measures in the northwest part; (3) as beds in the Tertiary in the southeast corner, and (4) as local beds or pockets in the glacial drift north of Missouri River. The coal measure clays are probably the richest of the stoneware clays, and developments have reached an important scale in Henry county. The shales of Missouri occur mostly in the coal measures and Mississippian formations. Shales yield, as a rule, rather impure clays, but are particularly adapted to the manufacture of paving brick, sewer pipe, drain tile, roofing tile, terra-cotta, building brick and fireproofing. St. Louis naturally takes the lead in the manufacture of clay wares in Missouri, all the products and many others being made there. Terra-cotta made in St. Louis is sold throughout the United States. Some terra-cotta and sewer pipe have been made also in Kansas City. Paving brick or vitrified brick are made in all the large cities of Missouri, and in many of the moderate-sized ones, and the same is true of the building brick industry on a still larger scale, for the local market for building brick in the small towns is better than for pavers. Building brick are made from a wider variety of materials than other clay products. Missouri shales, Glacial clay and river-buff Loess are all utilized for building brick, and the first two materials for drain tile, so that both of these industries are generally distributed through the north half and southwest one-eighth of the State.

What has been done in Missouri can and will be accomplished in the Southern States having equal advantages in respect to raw materials and fuels as soon as markets are

created and greater transportation facilities are afforded. By the creation of markets does not necessarily mean the establishment of new towns, for throughout the South potential markets already exist, needing only to be awakened. There is a crying need today in most Southern towns for cheap paving brick, and in the lowlands of the South for cheap drain tile. Just so long as it costs from 50 to 200 per cent. of the manufacturers' net price to transport these articles from the point of production and lay them down where they are needed, just so long will the average community get along without them. On the other hand, there are financial considerations which are apt to deter the investment of capital on a large scale in regions remote from large cities, for experience has proved that in order to make money a paving brick plant must have more than a small local market. Locations must, therefore, be sought where conditions are favorable for cheap manufacturing and for an outlet into a good trade territory.

For cheap fuel in proximity to important clay deposits, attention should be directed to the gas and oil fields of Oklahoma, Texas and Louisiana, and to the possibility of burning clays with lignite in Texas and Mississippi. That these fuels are practicable is demonstrated by the fact that gas and oil-burned shale brick, terra-cotta roofing tile and drain tile made in Southeastern Kansas have for several years commanded a good market for 200 to 300 miles from the points of production, and that good brick are already being burned from lignite in North Dakota. Water transportation should serve to a greater extent than it now does for such bulky products as clay wares, and in this respect the South, with its navigable rivers and extensive coast line, is particularly favored.

Notwithstanding the number of known deposits of kaolin and the extensive areas that probably contain it in the South, the output of American mines is as yet insufficient to supply the home demand, and about 200,000 tons of kaolins, mostly from England, are imported annually to the markets at Trenton, N. J., and East Liverpool, O. The prices realized are low, on account of the kaolin being brought as ballast in vessels, and this perhaps accounts for the lack of enthusiasm in its development at home, but the situation offers interesting possibilities.

The value of clay is based on its purity, physical properties, size of deposit, the facility with which it may be quarried or mined, its distance from transportation facilities, its distance from markets and the demand in those markets. Freight rates generally are higher on clay manufactures than on raw materials, yet few but the very finest grades of clay will stand the expense of handling and shipment to distant points in the raw condition; therefore, the development of most of the industries based on the clays that occur in the South must be carried on at home. At present the aggregate value of the clay products made in Maryland, District of Columbia, Virginia, the Carolinas, Georgia, Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Oklahoma and Texas amounts to less than 16 per cent. of the total for the United States.

One year ago in the MANUFACTURERS' RECORD the writer called attention to the valuable granite and marble resources of the South. In this paper a few of the important areas of limestone (including dolomite) and of sandstone will be pointed out, but the reader is respectfully referred to the various State geological survey reports for complete data and details. It should be repeated here that the heavy accumulations of residual soil and rock debris characteristic of the non-glaciated Southern States are apt to hinder quarrying in two ways—first, by obscuring rock outcrops, and thereby preventing the discovery of good ledges, and second, by rendering the surface rocks, where visible, of unsound and unattractive appearance. If these facts are given due consideration in prospecting, early discouragements may be overcome and deposits of unexpected value are more apt to be reached than surface appearances would indicate.

While the stone trade throughout the United States has in general been holding its own, several adjustments have been necessitated by changing conditions. Good cut stone is still very popular, but rubble and range stone do not now find so large a demand on account of the increase in the use of concrete. The very use of concrete, however, has, in areas where gravel is not plentiful nor clean, created a strong demand for crushed stone. It is, therefore, necessary in connection with most limestone quarries and at many hard sandstone quarries to install and operate crushing plants. This naturally raises the stone business to one requiring a larger initial outlay than it did six or eight years ago. In normal years there is a large demand for crushed limestone for blast-furnace flux, and an increasing demand for the purest limestone for chemical purposes, such as the production of soda-ash, so that the stone man has to contemplate the conversion of much of his quarried material into products other than building stone. In many instances this is a blessing to the quarry, for waste materials may thus be converted into salable by-products. An instance has come under the writer's observation recently of a quarry where a beautiful sandstone is obtained from the lower parts of a face 80 feet in height, and in order to secure choice stone aggregating only 20 to 25 per cent. of the quarried product, three or four times as much inferior material must be handled. This quarry could not be operated were it not for the fact that much of the inferior material is worked into paving blocks, and the chips and culls are run through a crusher, even the sand screenings being saved.

Limestone and sandstone are of sedimentary origin, and do not depend upon igneous agencies or deformations of the earth's crust for their present condition or distribution. They are found, however, in areas not far removed from crystalline rocks, such as granites and marble, but instead of being restricted to these areas they have a much wider distribution, and are found throughout the Mississippi Basin, and underlie the Great Plains and the Coastal Plain. Where they are of comparatively recent date, as are some of the Coastal Plain sediments, the rocks may be only very slightly indurated, and thus of little value. Age is, however, not always a sure criterion of the strength of a stone, for some of the Tertiary sandstones of Texas, Louisiana and Mississippi are in places very hard, while the St. Peter sandstone of Ordovician age—laid down many ages before the coal measures—is generally so soft as to be crushed to sand between the fingers, and is of value principally as a glass sand on that account.

Limestone and sandstone, by virtue of their very wide distribution, will always be the most commonly used rock for ordinary structural purposes, and it is a pleasure to be able to say that every State in the South is liberally supplied with these staple natural resources.

Limestone and Dolomite.—Throughout the great Appalachian Valley from Maryland to Alabama are belts of more or less magnesian limestone that are locally of importance where they are free from chert as sources of stone, lime and flux. At some places, especially in Tennessee, the material is of sufficiently crystalline texture to be commercially styled marble and to be shipped to outside States in large quantities. Near Chattanooga a bluish-black magnesian limestone reputed to be very durable is quarried for local use. At Darlington, in Northern Alabama, there is a very large quarry in one of the handsomest oolitic limestones in the United States.

In the Coastal Plain there are a few strata of limestone, but these are mainly rather soft, such as the cellular shell stone of North Carolina, the coquina of Florida and the chalky limestone of Alabama and Mississippi. In Texas the Cretaceous limestones are fairly hard, and of excellent quality. They are quarried at Austin and at San Saba, and there are quarries in dark, fine-grained Paleozoic limestones at Marble Falls, Burnet county.

Around the Cincinnati and Nashville uplifts in Kentucky and Tennessee are magnesian limestones of Ordovician age that are of value mostly for local purposes, but in Kentucky, near Bowling Green, are beds of oolitic limestone that bid fair to rival the famous Bedford Indiana stone.

It is estimated that in Missouri there are 25,000 square miles underlain by good quality limestone. Limestones from all the Cambro-Ordovician and Carboniferous formations are the most extensively distributed. Rock from the former is used mainly locally, for instance, at Jefferson City and St. Genevieve. Lower Carboniferous limestones are perhaps the most valuable for building purposes as well as for lime, on account of their greater purity, more even texture and ease of working. Large quarries from which much stone is exported annually are operated at Carthage, Phenix and Hannibal. This particular formation, the Burlington, has a wide surficial distribution in Missouri, and the areas from which good stone might be quarried are not restricted to the localities at present exploited.

Northern Arkansas, in the Ozark region, contains practically the same limestone formations as are present in Missouri. Hundreds of miles of outcrop of limestones are afforded by the dendritic drainage of White River and its tributaries. Among the formations that contain material of much promise may be mentioned the Izard limestone, the St. Clair and St. Joe "marbles." Near Batesville, Ark., there is quarried a handsome, hard, white limestone, from which the new State Capitol at Little Rock is being constructed.

Oklahoma is reported by the State Geologist to contain limestone in inexhaustible quantities in six different regions: (1) The northern part; (2) the northeastern; (3) on the Red River slope, south of the Arbuckle and Ouachita Mountain uplifts; (4) the Arbuckle Mountain uplift; (5) Wichita Mountain uplift, 10 to 30 miles northwest of Fort Sill, and (6) the outcrops of the Wapanucka limestone, from near Atoka to western Le Flore county. While the stone from each of these areas possesses peculiar merit, perhaps the area deserving most careful exploration at present is the northeastern area, which contains the southwestern extension of the horizon of the famous Carthage (Mo.) limestone.

Sandstone.—Sandstone is one of the most widely distributed of sedimentary rocks, and occurs in a variety of forms, depending upon the composition and cementing material. Popularly, sandstones are supposed to be composed of grains of quartz sand, and the majority of them are, but on careful inspection some will be found to be composed largely of grains of dolomite, or more calcareous material; others will be found to contain many grains of mica, or feldspar, or magnetite, or slate, or carbonaceous material, or mixtures of two or more of these minerals. The cementing material may be very slight, so that the rock is friable, or it may be very dense and hard. The cement may be of iron oxide, of silica, of calcium carbonate, or of argillaceous material. It is impracticable here to go farther into detail as to the character of sandstones, but emphasis must be laid on the fact that on account of the wide variation in sandstones, greater care must be exercised in their selection for building purposes than in that of any other rock. Sandstones were among the earliest rocks employed for building purposes in this country, and today the value of sandstone produced ranks about the same as that of marble.

In the Southeastern States, perhaps the best-known sandstone is the brown and reddish Triassic stone of Maryland and Virginia, quarried more extensively in the former than in the latter State. Many buildings in Washington, D. C. including the Smithsonian Institute, are built of the Maryland Triassic sandstone. In West Virginia occurs a great deal of sandstone, on which rather thorough tests have been made recently by co-operation of the State and Federal geological surveys. The sandstone in West Virginia is of Carboniferous and Devonian ages.

Triassic sandstone outcrops near the lower margin of the Piedmont Plateau in North Carolina, and affords fine-grained, compact, light and dark reddish-brown stone, comparable in quality with that in Maryland.

Carboniferous and Silurian sandstones abound in Tennessee, Georgia and Alabama, but for the most part they are of buff to unattractive reddish hues. They are quarried to some extent for local use and for building coke ovens. It is reported that there are beds of attractive light-colored stone suitable for building purposes, but yet rather remote from transportation facilities in the Chattoga Mountains of Georgia. In Kentucky light-colored sandstones predominate, and are being quarried on an important scale. The Kentucky sandstones are known as "freestone." Much of the Kentucky stone resembles the famous Berea (Ohio) stone in appearance and quality. Missouri's best sandstone occurs in the lower coal measures, and important quarries have been opened in it at Miami, Carroll county, and Warrensburg, Johnson county. This rock is a light-gray to bluish-gray calcareous sandstone that grows harder upon exposure. Blocks 10x4x7½ feet can be quarried without difficulty.

Arkansas abounds in undeveloped areas of sandstone. In the Boston Mountains are beds of excellent light-brown sandstone of Carboniferous age; at Batesville and in places in the Ozark region are light-yellow sandstones of Mississippian age which have been used locally, but which are as yet but little developed, and brown, massive freestone is reported to occur not far from Fort Smith.

Sandstone is probably the most widely distributed building stone in Oklahoma. Probably the best areas are in the coal fields of the east-central part of the State. The sandstone is generally light brown to gray in color, regularly bedded and of fine texture, and should prove to be a handsome building stone. It generally outcrops in positions favorable for quarrying, in bluffs, cliffs and hilltops. The local stone is very greatly prized for business blocks, residences, etc., and there is opportunity in this rapidly developing State for the establishment of several large quarry industries.

The east half of Texas contains sedimentary rocks of practically all the systems from the Carboniferous to the recent. This is the most populous half of the State, and sandstones from the Carboniferous have been used locally to a considerable extent. Judging from the value of the output of sandstone as compared with the population of this

State, there is still room for development of many quarries so situated as to reduce the freight rates on stone in building centers.

Taken as a whole, the stone supplies of the South are still among her least developed resources. This is due partly to the fact that heretofore there has not been a great necessity for substantial buildings and public works. Now that these conditions are rapidly changing, it may be expected that the stone trade will feel the quickening pulse and readily respond to it.

RAILROAD WORK SOUTH AND SOUTHWEST.

A Glance At What Was Accomplished in the Recent Past, and at Prospects for the Near Future.

By Samuel G. Wilmer.

[Written for the Manufacturers' Record.]

There is now in the Southern States a total of nearly 70,000 miles of railroad, the exact figures being 68,529 miles after adding the new construction of 1909 as totaled in the recent annual review of the Manufacturers' Record. Adding to this the mileage of Missouri and Oklahoma, together with the new work in those States during the past year, makes a total of 82,529 miles for the South and Southwest. Yet it is expected that the year 1910 will witness a further addition of from 3500 to 4000 miles of track to this imposing total, which is more than one-third of the mileage in the entire country. This, of course, means only main lines connecting the different points reached, and does not include second track or sidings.

During the past year, while railroad building did not equal expectations for various causes, legislative, financial, etc., with which the public is familiar, some of the companies manifested a very enterprising spirit and proceeded to plan and execute for new routes with confidence in the future, although it must be said that these instances of liberality and complete grasp of the general railroad situation, its probabilities and prospects, were few. Yet many new enterprises have been planned and some of them begun, with the anticipation that a few at least will in time be absorbed by existing systems to the advantage of the latter, thus providing for needed extensions of trunk lines, and which they themselves might have accomplished, but for the untoward conditions which began two years ago, hampering the companies in their work and discouraging investments for new transportation routes. But the panic and its immediate consequences are long past, even if not forgotten, and business has improved to such an extent as to warrant generous action on the part of the railroads to provide for the future, which may be justly expected to soon equal and exceed, in the development traffic, the busy months of 1906 and the early part of 1907.

The data gathered and published by the Manufacturers' Record about new railroad construction in 1909 and the prospects for the new year reveals much confidence and courage, although the work accomplished during the past 12 months was far short of what was anticipated one year ago. Notwithstanding this, the efforts of the roads immediately concerned to build extensions in the coal regions of Virginia, West Virginia, Tennessee and Kentucky continued with vigor. The Norfolk & Western and the Chesapeake & Ohio, the older lines in this section, continued to push out branches to new mines, and the Virginian Railway, as well as the Carolina, Clinchfield & Ohio, both new roads, kept on with their work to place more coal within the reach of consumers. The Clinchfield road is now driving northward to Elkhorn City, Ky., where it will connect with the Chesapeake & Ohio, and it has completed and put in operation its line as far south as Spartanburg, S. C. Construction is also under way on the Winston-Salem Southbound, a line that is being built by the Norfolk & Western Railway and the Atlantic Coast Line, and which will, when completed next fall, enable them to carry coal southward by a direct route. This road is being made in a very substantial manner, and from its beginning will be thoroughly up to date. There is another new road in prospect called the West Virginia Railway, which is expected to handle much fuel, as well as iron ore. It will run from Clifton Forge, Va., on the Chesapeake & Ohio Railway northward to Keyser, W. Va., about 186 miles, connecting at the latter point with the Baltimore & Ohio and the Western Maryland railroads. The Hampshire Southern Railway, which is practically an extension of a Baltimore & Ohio branch, is being built in West Virginia down the South Branch Valley from Romney to Moorefield and Petersburg, about 40 miles, and may be extended farther, although the West Virginia Railway will connect with it at the latter point on its way from Clifton Forge via Monterey, Va., and Franklin, W. Va., to Keyser, following the valley just east of the main ridge of the Alleghanies. In the eastern part of Virginia steps have been taken to extend the Richmond & Chesapeake Bay Railway from Ashland to Washington, D. C., about 115 miles, and the amendment to its charter authorizes it to use any motive power, which may be expected to result in establishing a new double-track route between Washington and Richmond paralleling the old existing road, the Richmond, Fredericksburg & Potomac. The Norfolk & Southern, although in receivers' hands, continues to push its work, and has completed the five-and-one-half-mile bridge over Albemarle Sound, besides finishing a short connection and perfecting its system.

The taking of the Seaboard Air Line out of the hands of receivers was a notable accomplishment of the past year, and the work done under the protection of the courts demonstrated the value of the system and its possibilities. It is expected that some important results will follow, now that the company has been reorganized and good times are at hand. The other two big systems in the eastern part of the South, namely, the Southern Railway and the Atlantic Coast Line, while not engaging in much new construction, are double-tracking and otherwise putting in shape their lines, although, on the Southern particularly, much remains to be accomplished in the way of eliminating wooden bridges and trestles.

The Georgia & Florida Railway continues to push work toward creating its through line from Augusta, Ga., to Madison, Fla., which is finally to be extended to the Gulf. It has already begun the operation of through trains in connection with the Central of Georgia, pending the completion of its own line into Augusta, which is to be built this year. There are also two new roads in Georgia which are being built and on which some work was done during 1909; one of these is the Sparks Western Railway, which when completed will reach from Sparks via Ellenton, Ga., to Moultrie, Ga., 26 miles, and the Valdosta, Moultrie & Western Railway, which is also building to Moultrie, about 40 miles, via Morven. The Atlanta, Birmingham & Atlantic Railway, which, like the Seaboard Air Line and the Norfolk & Southern, had to seek the protection of the courts during the past two years, has completed its line to Bessemer and Mulga, Ala., and is now building from Bessemer to Birmingham. It is rumored that this company will take up as soon as possible the building of a cut-off from some point in Alabama, so as to make a short line between Birmingham and Atlanta.

Down in Florida the Florida East Coast Railway is finishing its line to Key West. Much work was done on this extension of about 45 miles southward from Knights Key, but the big hurricane in September did considerable damage to the roadbed and the working equipment, so that its completion has been delayed and the construction will not be finished until some time this year. In the western part of the State the Pensacola, Mobile & New Orleans Railway is building a line about 45 miles long from a connection with the Pensacola, Alabama & Tennessee Railroad to Mobile, Ala. Construction on this is being pursued quiety, but steadily, and it may be completed this year. The Florida Railway, which is now 52 miles long from Perry to Live Oak, Fla., has just filed a mortgage of several millions to build about 200 miles of extensions, and it is proposed to extend eastward from Live Oak to Jacksonville and Fernandina, besides westward probably to a point on the Gulf not yet announced. This would make an east and west line about 300 miles long across the upper part of Florida and connecting important points.

The Union Springs & Northern Railway, a short line in Alabama, may do some new construction this year by building an extension northward. The Alabama, Tennessee & Northern, which is also an Alabama road, continues to push its line southward, so that it will eventually join the Tombigbee Valley Railway, also owned by John T. Cochrane. The Mobile, Jackson & Kansas City Railway has been reorganized as the New Orleans, Mobile & Chicago, and a branch to New Orleans may be constructed. The Baton Rouge & Gulfport Railway Co. is a new project which is to build immediately 125 miles of line from Gulfport, Miss., to Baton Rouge, La.; the Louisell Lumber Co. of Mobile is interested. The New Orleans Great Northern, which has finished its line to Jackson, Miss., is contemplating an extension eastward from Columbia. Up in Tennessee the Knoxville, Sevierville & Eastern Railway has been completed, and may become, according to rumors, an important link in a line between St. Louis or some other point on the Mississippi River and a port on the Atlantic coast. The Tennessee Central, it is also said, may be linked in such a route. In the western part of Tennessee an interurban railway from Memphis to Nashville is being promoted, and the Dyersburg & Northern, an existing line, contemplates an extension northward to Hickman, Ky.

The Louisville & Nashville has completed the Madisonville, Hartford & Eastern Railway, a line 55 miles long, but there was not much other construction in Kentucky during the past year. There is, however, a big electric railway plan for an interurban line from Cincinnati, O., to Louisville, Lexington and Maysville, Ky., which, if executed, would require about 250 miles of road. In Arkansas the Arkansas, Louisiana & Gulf Railway will extend this year from Hamburg to Hazen, Ark., 135 miles. The Memphis, Paris & Gulf has extensive plans on hand for extensions both east and southwest, the former to Memphis, Tenn., and the latter to Dallas, Tex. In Missouri a 250-mile electric railway plan has been chartered to build from St. Louis to Kansas City, and this road may be constructed. One of the biggest schemes reported, however, is that of the Manufacturers' Railway of St. Louis, which has a terminal line there, to build southwest to Springfield and connect probably with the Fort Smith & Western Railway, which would give a new trunk line from St. Louis into Oklahoma, and possibly to Texas.

In the Lone Star State there are many big plans, as befits its magnitude. The Santa Fe system leads in the amount of line to be constructed, and is engaged now in the very important work of building a route over the Llano Estacado from Canyon City, Tex., southeast to Coleman, connecting at each terminus with existing lines of that system forming a route between Galveston and the Pacific coast through what is expected to be (in Texas, at least) a rich and prosperous territory. This route, however, may be shortened by the building of an additional line from Lubbock, Tex., to Texico, N. M., 90 miles, which would be a cut-off to be followed by business between the Gulf and the Pacific. At present, however, the line has been built from Canyon City down to Lubbock, and that course will be followed, although it appears probable that the cut-off will eventually be constructed. The Stamford & Northwestern, a line 82 miles long, was built during the past year from Stamford to Spur, which latter is in Pickens county. This road is now part of the Wichita Valley system, which is controlled by the Colorado & Southern. The Rock Island, which is building from Amarillo to Tucumcari, N. M., to make a desired connection, contemplates building from Graham westward to Stamford, Tex., and it is expected that this will be constructed or at least undertaken this year. The Frisco system will build from Brady to Menardville, Tex., and possibly from Brady toward Fredericksburg, Tex., 75 miles. Construction of a railway has begun from San Antonio toward Brownsville, and another line is promised from San Antonio to Fredericksburg. The Kansas City, Mexico & Orient Railway is busy building its line southward to the Rio Grande, and has completed 78 miles in Texas this year. Probably an equal amount will be accomplished in 1910, and maybe more. The Missouri, Oklahoma & Gulf Railroad is rapidly building to Denison and Sherman, Tex., and the Abilene & Southern, which completed its line from Abilene to Ballinger, Tex., the past year, will extend from Abilene southeast during 1910. The Artesian Belt Railway, which has constructed 43 miles of line from McDonough to Christine, will extend 30 miles to Simmons City, and proposes to push on to the Rio Grande. The Sugarland Railway and the Imperial Valley Railway have in contemplation together about 90 miles of line for this year, although in 1909 only about 20 miles have been built. The Gulf, Texas & Western has constructed 75 miles of line from Jacksboro via Olney to Seymour, Tex., and proposes to keep on from the latter point to Benjamin, 30 miles farther. The Houston, Fostoria & Northern has built 48 miles of line from Midline to Cold Springs and Elmina, Tex., and the Texas Central has some good plans in view which will be executed this year, one including a line from De Leon to Cross Plains, 46 miles, and the other of indefinite length from Rota into new country.

For a new State Oklahoma has witnessed very little railroad construction within the last year or two, chiefly because her legislators have seen fit to frame some laws antagonistic to progressive railroad methods. Several new companies have built some lines, but the large systems are doing practically nothing in the way of extensions, for the reason that they are prohibited from taking them into the parent company's fold after they are constructed. In other words, they must maintain a separate organization for each new road built. There is, however, a change of opinion apparent, and it is probable that

before long the railroads will receive more liberal treatment in Oklahoma, for the progressive men of the State realize that capital cannot be expected to seek investment there under onerous conditions.

Generally, the outlook for railroad work in the South and Southwest is hopeful and encouraging, and perhaps the pace set by a few of the companies looking toward preparation for the future will have the proper effect of stimulating all the roads to necessary action.

The Coming Financial Strength of the South.

By Col. Robert J. Lowry, President Lowry National Bank, Atlanta.

[Written for the Manufacturers' Record.]

The year 1909 has drawn to a close, and has passed into history, and the different lines of industry and agriculture have been engaged for some weeks past in taking their annual inventories. The year just closed has been the most prosperous from an agricultural standpoint in the history of the Southern States. There has not been a cotton crop in the South since 1873 that has been sold by the farmers of the South for as high an average price per pound as this one. With cotton selling from 13 to 15 cents per pound and cottonseed selling for $25 to $30 and over per ton, the present crop of raw cotton should be worth at least $850,000,000. This much virgin wealth from the soil of our Southern States will enable our farmers to pay off their mortgages; it will aid in the establishment of new industries, as well as new banks and other financial enterprises, and will generally promote the prosperity of all institutions and enterprises already established and operating.

The basis of the material prosperity and financial growth of the South is the cotton crop, although many other products of our soil are the source of a very substantial annual yield. Cotton and its by-products, however, represent so large a part of the South's agricultural output that it may be called our financial support and the basis of our material growth. Cotton is a gold-producing crop, and a large crop at good prices brings annually to the Southern States over a billion dollars. This fund is immediately put to work, and kept actively employed in the establishment and maintenance of industries and enterprises, for which the demand is steady, and from which the returns are profitable. The South raises 75 per cent. of the world's supply of cotton, and as the demand increases the acreage must necessarily increase. I am satisfied that within a very few years a 20,000,000-bale crop will not be excessive, in view of this ever-increasing world demand for the fleecy staple of the South. Ten years ago the South, raising 10,000,000 bales of cotton, received in money therefor about $300,000,000. This year the South will raise from 10,500,000 to 11,000,000 bales, and, as stated, the yield will be about $850,000,000.

One can hardly prognosticate the future of a section without casting his eye backward a few years and noting the progress to this time. In the case of the Southern States such a retrospective view, in the light of present conditions in the South, makes the progress for the last 40 years appear well-nigh marvelous. Back in the sixties, just after the Civil War, the Southern States were a devastated mass of ruins. With our towns sacked, cities burned, farms laid waste, stock killed, our trade destroyed, our money worthless, our social system swept away, our people without legal status, money, credit, material or training, we had every unfortunate condition to contend with. Practically bankrupt, nevertheless we were not dismayed. Battlefields were quickly plowed up and converted into cotton fields. The stern command of "Forward March" soon gave way to the sterner command of "Gee-haw" as the battle-scarred veteran plowed soil which history had immortalized. Ruin was never more complete, but restoration never swifter.

Nearly 45 years have elapsed. What have we done? Phoenix-like, we have risen from the ashes of the Old South, and with a constantly increasing output annually of raw and manufactured material we today stand upon a solid financial foundation and enjoy as high a national credit as could be desired. The influx of outside capital is steadily on the increase. Investments in all classes of Southern securities are annually made in enormous sums, and capital seems less timid when invested in the South than elsewhere. Our cities, counties and States find ready sale for their bonds when issued for any public purpose of merit. Every year the influx of outside capital seems to be in greater proportion, and, in view of the natural resources of the South, especially its water-power, the possibilities of this section through the investment of both home and foreign capital seem to be unlimited.

Every line of industry and enterprise in the South has progressed phenomenally during the past 25 years. As stated, cotton is our principal agricultural product, and the domain of King Cotton is the best section of our Southern country. This product—a gold-producing crop—is shipped all over the world, and millions of spindles are humming as a result of the industry of the Southern farmers. In our Southern cotton mills we have now an aggregate of something like 10,000,000 spindles. The average cost of a cotton mill is about $20 per spindle. So it will be seen that the actual cost of cotton mills in the South is about $200,000,000. This is an immense investment, and shows the decided progress of the Southern States in industrial lines, but it seems small, too, when we consider that in our own mills we consume only about 20 to 25 per cent. of our cotton crop.

Annually our crops are larger and larger, not only of cotton, but of everything that man needs for his maintenance and comfort. You could build an impassable and impregnable wall around the State of Georgia, for instance, and in less than 10 years there would not be room in the State to hold its products. We can raise everything that our people need, and much more than they need, as evidenced by our constantly increasing volume of exports. Domestic and foreign consumption of Southern products makes the trade of our Southern section in raw materials alone an item of such size as to warrant seemingly unreasonable predictions as to the future financial strength of our section. The gross advance in the value of the cotton crop alone now over what it was 10 years ago is something like $500,000,000. We can get some idea of the significance of this statement by calling attention to the fact that out of the profits from one crop the farmers could buy all the cotton mills and have $300,000,000 profit left over. The $200,000,000 invested in the cotton mills is invested permanently and for a long time, but the $500,000,000 increase which the farmers receive is annual.

Again, all wealth is directly traceable to the products of the farms, forests and mines. We have perhaps made the greatest progress so far in agriculture, and, of course, where the farmer is prosperous, ere long this prosperity permeates the length and breadth of the Commonwealth and insures financial ease and comfort to everybody. Whatever benefits the farmer helps everybody, from the inhabitant of the farm, the hamlet and the town, to the citizen of the busiest metropolis in the nation. Our forests have for some years past yielded in the neighborhood of half the lumber cut in the United States and the product of naval stores from our Southern pine has been, like cotton, practically a Southern monopoly. Our mines yield about 15 per cent. of the total products of mines in the United States. With these three direct agencies creating wealth, and the people alive to their surroundings and alert to use the natural resources so bountiful in the Southern States, our material and industrial, and hence our financial, growth and strength in the future will increase in a greater ratio than it ever has in the past.

The property value of the South, that is, the 14 Southern States, is about $21,000,000,000, while in 1880 it was about $7,500,000,000. From 1880 to 1900—20 years—the value of property of these Southern States increased from about $7,500,000,000 to nearly $14,000,000,000, and from 1900 to the present year—nine years—it has increased from nearly $14,000,000,000 to nearly $21,000,000,000. At this rate of increase, what will it be 20 years from now? Our 14 Southern States now represent about one-seventh of the entire property value of the United States, and this estimate is very conservative.

In 1880 the deposits in our banks and trust companies amounted to about $150,000,000; they are now about $1,250,000,000. Deposits in our banks represent the increasing financial strength of our section. That these deposits in less than 30 years have been multiplied by 10 is an astounding fact, and is significant of a future growth which can scarcely be conjectured, much less estimated.

What of future policy? In view of the immense advantages to the South of the Orient in the matter of commerce; in view of the enormous territory there, which not only desires to consume our product, but endeavors to do so even under difficulties; in view of the continuous growth and increase of production both of our soil and our factories; in view of all the advantages to be derived from permanent commercial relations with the Asiatic market, the digging of the Panama Canal will work wonders here in our Southland. When we have free commercial intercourse with the Oriental countries we can consume our entire cotton crop in mills here at home. We can reap a double profit from this immense crop, because the farmers will sell their cotton at good prices to home mills, and the mill men will sell the manufactured fabrics to the Oriental customers. All industries will, therefore, necessarily receive a double impetus, for increased manufacturing interests will naturally increase the demand for all kinds of supplies, and business in every line will thrive as never before. Besides the shipping of the product of our mills we will ship turpentine, oil, coal, lumber, iron and everything that we produce in excess of home demand, and our exports, I venture to say, will in time exceed those of any other section of the Union.

Coupled with the opening of this canal must come the upbuilding of a strong American merchant marine. The South is becoming more and more interested in this great question of ship subsidy every day, because the digging of this Panama Canal means the outlet for our exports to the Orient, and we want those hauled in American bottoms. This is not wholly a matter of pride, but it is a great economic question, because it is a severe drain upon the resources of our people to pay foreigners to haul our exports. We should see for ourselves what other nations have gained by public bounties, and should profit by this object-lesson. It is a matter of sincere regret to many of our leading capitalists and business men generally that our Southern Senators and Congressmen have thrown the weight of their influence against subsidizing ships, and thereby building up a merchant marine. Sooner or later they will be compelled to recede from this position, for the reason that the people of the South now see that the Panama Canal is the gateway for Southern goods to the Orient, and an American merchant marine must come! This great outlet for our surplus products is the highway of the future which the South will travel to a commercial eminence and a financial strength second to none in the world!

Unprecedented Demand for Farms and Homes.

By J. W. White, General Industrial Agent, Seaboard Air Line Railway.

[Written for the Manufacturers' Record.]

Realization of the South's real worth seems to have dawned suddenly upon the residents of other sections of the country if we can accept as an index the unprecedented demands for farms, homes and other forms of investment.

In the distribution of the immigrant the North was given the laborer, while to the West went the homebuilder, the farmer, who by his energy, thrift and intelligence created an empire of such magnitude as to command admiration from the world at large. During this period the South not only remained passive, but was the victim, through misrepresentations, of the agencies controlling the trend of immigration and the practical allotment thereof. In view of these facts the work of exploiting the resources and convincing people of our possibilities has not been a simple task, and but for the persistency of a few champions whose abiding faith is of the kind "that moves mountains" there would, in all probability, be a different story to relate. When a full accounting shall have been given for the year now ending it will show actual performances of a surprising nature to an extent that will be indeed gratifying.

In our efforts to overcome the prejudices heretofore existing we have urged a personal investigation, feeling confident that such a course would correct the erroneous ideas existing, and besides we have realized that a change of home is a serious matter involving so many conditions that every possible consideration should be given it before the final step is made. To assist in this movement we have accorded special round-trip rates, made such arrangements as would facilitate examinations, and, above all, have endeavored to point out the disadvantages, and the remedy where possible, as well as the favorable conditions presented, thereby leaving the matter in such shape as to enable the homeseeker to intelligently decide for himself.

By reason of the unusual demand we have had to contend with some persons bent on speculation only, they having little regard for anything except such profits as might be realized. We have done everything possible to prevent such operations when not based upon meritorious plans by according to all inquirers a statement of true conditions as to the localities, reciting in detail as far as possible the character of the soil and the other conditions surrounding. There are many reputable persons, however, who have likewise entered the field from a purely speculative standpoint, and these, generally dealers in land, have formed companies for the purpose of settling the territory, and on these our

endorsement is freely given. In other words, we are endeavoring to assist in the South's development in such a way as to bring about lasting conditions.

Florida has probably received more attention, and the demands for its land have been greater, perhaps, than any other State. Each of the other States which we traverse, however, has also added materially to its population by the settlement of people determined to make their future homes in a region where nature's generosity abounds.

The people who have settled in our territory are largely from the Middle West, yet quite a number have come from Northern and New England States. Many of these were prompted to change locations by reason of a rigorous climate, and after investigating our conditions, thus satisfying themselves that a living could be made, quickly decided to come with us. We find that they are well pleased, and are now our strongest advocates; through them we hope to greatly augment their number.

Instead of following old methods of least resistance, which in many instances were opposed to the best results, the growers have made a study of their soil, familiarized themselves with other necessary conditions, and it is a pleasure to note the degree of intelligence now being applied to farming operations. The results of scientific research are being used with profit, and the advice of those who have devoted years of study and labor to agricultural conditions is now eagerly sought.

Associations have been formed with a view to properly marketing the products, and while they are yet in their infancy, they cannot fail to eventually supply an absolute necessity—the one missing link in the chain of prosperity to which the farmer is entitled.

We are very well pleased with the results thus far accomplished, and feel a degree of encouragement that will spur us to greater efforts during the coming years.

Our industrial development has about kept pace with the immigration movement, we having been favored with many enterprises of a substantial nature, among which might be mentioned: Alabama, a million-dollar plant for the manufacture of Portland cement at Ragland, showcase and radiator factories at Queenstown; Georgia, a smaller cement plant at Rockmart, a large fertilizer plant at Atlanta, textile mill at Calhoun Falls; North Carolina, a large oil mill at Maxton, textile mills at Roanoke Rapids, Warrenton, Henderson and Great Falls; Florida, an extensive phosphate plant near Plant City and 75-ton ice plant at Palmetto, the latter built to care for the vegetable business in Manatee county. A number of plants have been enlarged and many enterprises of various kinds located throughout our system's territory.

Cities, towns and villages everywhere give evidence of progress through the installation of modern conveniences, and the highways leading to the outlying districts are rapidly being converted into good roads, the importance of this feature being universally recognized and every possible effort given toward such movements.

Norfolk, Va.

SWEEP OF COMMERCE TOWARD GULF PORTS.

By Albert Phenis.

[Written for the Manufacturers' Record.]

No fact in connection with the enormous recent development of the Southwest is of more striking significance than the growth of commerce through the Texas ports. So rapid has been this growth that few of even the well-informed men one meets in such places as Boston, New York or Chicago will fail to express surprise when the statement is made that in value of total foreign commerce Galveston leads every city of the Union outside of New York, having passed New Orleans, Boston, Philadelphia and Baltimore, and being more than $100,000,000 ahead of San Francisco, and nearly $50,000,000 ahead of all the Pacific ports combined.

They do things in a gigantic way out on the Pacific Coast. The men are big-minded, the cities are amazing evidences of the section's rapid progress and greatness and every physical feature betokens a scale of magnificence not in evidence anywhere besides. The whole world talks of the Pacific Coast bigness, and yet the modest little port of Galveston does a business with the outside world amounting to about $193,000,000 a year, as against $81,000,000 for San Francisco, $52,000,000 for the Puget Sound ports and $12,000,000 for Portland, Ore.

That there may come further changes in the standing of the country's ports is possible, of course, but there are forces at work that lead many impartial observers to believe that there never will come a time again when the Galveston port will be of less than secondary importance among the ports of the United States. And this view is held in full recognition of the inevitable great growth of New Orleans and the other ports to the east on the Gulf Coast, and likewise conceding the fact that at least two other ports in Texas will have to be reckoned with, namely, Port Arthur and Aransas Pass.

The strength of the Galveston port is manifestly the wealth of the vast plain to the north of it, stretching from the Gulf to the British possessions, and from Mississippi River to the Rocky Mountains. Here is an area of a million square miles of territory capable of supporting 400,000,000 people, but with a present population of but 18,000,000. There are 900 miles of coast to the westward of the Mississippi delta. It is more than 400 miles from New Orleans to Galveston, and outside of Port Arthur and Aransas Pass there are no points on the Gulf besides Galveston where physical conditions make it possible to economically build up a port adapted to the world's commerce.

Galveston has the railroads which traverse the entire Mississippi plain to the north. It has a comprehensive system of wharves and docks, and it has a channel of more than 30 feet of water, through which ocean-going vessels come up to their docks under their own steam. It has the advantage of an established business system and of an early start. In addition to these points, it has behind it the co-operation of the most powerful individual forces known to the South and to the country today. For there is a development under way that will tremendously enlarge the scope and character of the Galveston port until the Galveston district will include other towns along the Galveston Bay, and will probably take in Houston and all the developments along the ship channel, or Buffalo Bayou, for the entire stretch of 50 miles between Houston and Galveston. And these developments are not in embryo, but are already under way. The improvements on Galveston Bay are partially completed, so that a considerable commerce is already being done at Texas City and Port Bolivar, subports of Galveston. The ship channel, or Buffalo Bayou, is being dredged to the turning basin, four miles from Houston, for ocean-going vessels, and at Penn City, 14 miles down the bayou from Houston, where there is 26 feet of water, a start has been made toward the development of an industrial, warehousing and shipping center of the kind which must ultimately dot the bayou for its entire length.

The completion of the causeway, 150 feet wide and providing railroad tracks, wagon road and foot passage, connecting Galveston Island with the mainland, now under construction and to be finished by the end of 1910, will still further unite all the Galveston-Houston section into one development and community of interest. Texas City, five miles across the bay from Galveston, will then be practically a suburb, and its development will proceed with increased momentum.

Here is a development unique not only in the South, but throughout the world, and its importance in contributing a sustaining power to the prestige of Galveston's port is not yet fully understood by the public at large. Texas City is the expression of one man's superior knowledge of transportation. It is the embodiment of ideas thought out by Capt. A. B. Wolvin of Duluth, who has had more than 40 years' experience with the shipping of the Great Lakes, and who knows transportation problems as few men in the world do. He foresaw the future possibilities of Texas gulf-port developments 20 years ago, and purchased, with associates, an extensive tract of 7000 acres fronting on Galveston Bay, on a portion of which Texas City has since been built. On the Great Lakes, by evolving a type of boat with the maximum of carrying room and motive power, and constructing spacious bins with powerful loading and unloading machinery at the terminals, he is making money today hauling iron ore from Duluth to Chicago at 65 cents a ton that formerly cost $6 a ton to transport.

At Texas City the same big problems in carrying charges are being worked out in the same revolutionary way. Cargoes are unloaded by machinery at the docks, carried by electric cranes to any part of fireproof warehouses that will ultimately be a mile in length and are warehoused till such time as they are to be loaded on cars for distribution anywhere in Texas, the middle lower South or Mexico. The company's terminal railway, with 14 miles of switch tracks, connects with all the railroads running into Galveston. The warehouses being fireproof and fire-protected, an insurance rate of ¼ to ½ per cent. is available. Facilities provided enable the company to carry ocean freights for a half to three-fourths less than rates formerly prevailing, with the result that a saving is being made to Texas merchants alone amounting to $1,000,000 a month. The same favorable rates and facilities are applied to exports, so that a considerable export business is being built up, in addition to the 350,000 tons of freight per year now under contract for transportation from New York to Texas City.

The present development here, only partially completed, contemplates an expenditure of between $3,000,000 and $4,000,000 for docks, piers, warehouses, tracks and company buildings, and the development of the port has really only just begun. An industrial center will be built up here as well as a commercial port, based on the cheapness with which raw materials can be assembled and the facilities and favorable rates applying to the distribution of the manufactured products. Already an oil refinery has been established, which is turning out various kinds of refined oils as well as manufactures of paraffine, the oil supply coming from the Oklahoma oil fields.

The Government is committed to the extensive further development of the Galveston harbor, which includes Texas City and Port Bolivar. The Texas City channel, now 26 feet deep, is to be deepened to 30 feet, and a protecting dyke is to be built from the mainland north of Texas City to Bolivar Roads. This, with the Galveston causeway, will give to Texas City what will practically be a land-locked harbor.

The developments at Texas City and at Port Bolivar are alike called for by the great growth of commerce at the port of Galveston, which has outgrown the possible facilities of Galveston proper. Some 14 years ago Galveston received at her wharves the first ocean-going vessel under full load. At that time Galveston was tenth in the list of American ports, and New Orleans was supreme in the commerce of the Gulf. Galveston has overtaken every port except New York, for the reason that it is the nearest port to the territory that produces 60 per cent. of the export business of the United States. This fact has caused all the great railroad systems of the trans-Mississippi region to run their lines to Galveston, "where the greatest rail commerce of the world must meet the greatest water commerce of the world," as an authority puts it when considering the conditions that will follow the completion of the Panama Canal. The tremendous increase in the commerce of Galveston having already taxed the terminal facilities of Galveston to such a point that additional room has been found necessary, both Texas City and Port Bolivar have come into existence to meet a present demand. Port Bolivar is owned by the Gulf and Interstate Railroad, a subsidiary of the Santa Fe, which runs from Port Bolivar to Beaumont. Present port improvements consist of a pier 400 feet long, with five docks, which will accommodate five ocean-going steamships at one time. There is a large freight shed 800 feet long and 350 feet wide, of galvanized iron, floored with paving brick, and fireproof, so that the Galveston rates of insurance apply. Plans are on foot for three other sheds of the same size and construction. The company is now building a timber slip for handling timber in the water, and plans are in hand for large ore and coal docks. The handling of export lumber is a feature here, and there have recently been shipped from the port five large cargoes of export lumber. In the way of imports, iron pipe and granite have been brought in from Philadelphia and New York ports. The handling of tropical fruits, coffee, sugar, woods and building material for import, and of rice, lumber, naval stores, cotton, cottonseed products, grain and lumber for export, are considered the immediate lines of commercial development here.

There are 26 feet of water at the slip now, 30 feet in the channel and 28 feet in the turning basin, the Government having just finished dredging to the depth named. It has an appropriation to maintain these depths, the railroad maintaining the depth of the slip. The railroad is operating a transfer equipment between Galveston and Bolivar Point, five miles across, the equipment consisting of a tug and floating barge, with a capacity of 18 freight cars at one trip. On Bolivar Point the Government has the military reservation of Fort Travis, and along the front it is building a sea wall 17 feet high and half a mile long. It also has plans for a quarantine station at Bolivar, which will be the second finest in the United States. It is the expectation of the owners of Port Bolivar that here will be built up an important commercial, shipping and industrial center.

As at Texas City the personal backing of Capt. Wolvin is a factor to be accorded the greatest prominence in forecasting the future of the place, so at Port Arthur a vast advantage to the town's development is the fact that John W. Gates has practically "underwritten" the city. His home is there, he registers from there, wherever

he may be, and he works for Port Arthur, because he believes in the future of the place. He is interested in many lines of activity outside the oil company—the Texas—in which he owns stock worth a good many million dollars, and he stands ready to back any industrial enterprise for Port Arthur that will bear the scrutiny of various experts he employs. The business of the port here showed the greatest ratio of increase for the year ending June 30, 1909, of any port in the United States, and in tonnage it handled three-quarters as much as Galveston. It stands twelfth in the list of ports of the United States in total foreign commerce for the year ending June 30, and the growth it has made, which proves the commercial reasons for its existence, and the resources of the country tributary, form the basis for the local belief that Port Arthur is going to be one of the really big ports of the country.

In addition to the town of Port Arthur, Beaumont and Orange originate business which is exported from the port of Port Arthur. In order to provide these ports with better shipping facilities, the taxpayers of Orange and Jefferson counties have voted $500,000 for deepening the Sabine-Neches Canal from the mouth of Sabine River to Port Arthur. The canal is now 10 feet deep, and it is proposed to make it 25. The work will cost $800,000, but the Government will be asked to appropriate the additional $300,000 required, as it is already a Government canal. In case the Government should fail to do this, however, the people themselves will do the work. This will give Orange and Beaumont a minimum of 25 feet of water to the sea. While Sabine Lake is so shallow that it cannot be navigated by heavy draught vessels, and the character of the bottom made it advisable to dig canals around the lake rather than attempt to maintain a channel through it, both the Sabine and the Neches are deep streams, so that with the canal deepened to a connection with the 25-foot canal between Port Arthur and the sea, Beaumont and Orange will both become deep-water ports, and subports of Port Arthur.

Resources on which it is relied to build up a big port here are stated by local authorities thus:

"Within a circle drawn around Port Arthur of 50 miles radius, you will find:

"(a) The greatest oil refining and shipping region in the world—Port Arthur itself. Pipe lines from three States feed its immense refineries.

"(b) The greatest sulphur mining and shipping point in the world, not even excepting Sicily.

"(c) The greatest oil-well region on the North American Continent, comprising Batson, Sour Lake, Saratoga, Spindle Top and other fields.

"(d) The famous Southeast Texas and Southwest Louisiana timber region, which centers at Port Arthur.

"(e) The farms within this circle produce more rice than all the rest of the United States."

Port Arthur's location as the southern terminus of the Kansas City Southern Railway gives direct access to the packing-house products of Kansas City and Omaha, as well as the granaries of the Middle West. Port Arthur expects to profit greatly by the opening of the Panama Canal and the development of trade relations with Central and South American countries that is deemed certain to come about.

The third Texas port which is being developed now for ocean-going vessels is at Aransas Pass, and here another remarkable demonstration has been given of the public hunger for Texas holdings. The only pass for ocean-going vessels for all this vicinity is Aransas Pass, in a direct line southwest of the town of Aransas Pass, 5.7 miles distant. Burton & Danforth, real-estate men of San Antonio, saw an opportunity for commercial development of this port on account of the proximity of the big Taft ranch now being put into cultivation, the marvelous immigration into Southwest Texas and the requirements for additional ports to take care of the business the Panama Canal opening is counted on to create. They bought up large acreages adjoining Aransas Pass, which have been laid out in town lots and small truck farms. They organized a channel and dock company, and are cutting a channel across Harbor Island in a direct line between the town of Aransas Pass and the jetties. Docks and wharves will be constructed on the mainland and on the lower side of Harbor Island; there will be 25 feet of water in the channel and an industrial and commercial center will be built up in accordance with plans now formulated. Recently there was a sale of lots and truck farms, and excursion trains carried something like 3000 persons to the site—people who came mainly from North Texas and Oklahoma, but who represented in greater or lesser number about all of the States in the Union, and some foreign countries besides. Aransas Pass had only about 200 people in it before the Burton & Danforth activities, but it is figured that there will be 5000 permanent residents here within two or three years, and that an important shipping port will come into existence at an early day. Burton & Danforth are actively behind the enterprise. Some $2,000,000 is being spent in the work now in hand, and operating on harbor plans which are in accordance with the ideas of Government engineers in charge of this district, it is the belief of the promoters and their friends in Southwest Texas that a really important port will be developed at Aransas Pass.

GEOLOGICAL SURVEYS AND THE PUBLIC.

By Wm. B. Phillips, Director of the Bureau of Economic Geology, University of Texas.

[Written for the Manufacturers' Record.]

During the last year there has been sounded a distinctly new note in the United States, a note of serious warning that we are wasteful of the material resources of the country upon which our prosperity and our power are based.

Conservative associations and conservative commissions have sprung up from Maine to California and from Washington to Florida. The aid of the Federal Government and of many State governments has been invoked to check this fast-spreading evil, while many statesmen and other students of social and political economy are giving their attention to remedial legislation and advice. Even Texas, that vast empire of undeveloped wealth, has felt the new impulse and has its Conservation Commission. Quite apart from the purely political aspect of the matter, an aspect not altogether devoid of personal considerations, it is beyond question that, as a nation, we are extravagant and wasteful to a degree that is simply incalculable.

This reproach cannot be laid upon certain highly organized industries, such as the packing-houses, etc., but presses with increasing force upon those industries that are concerned with materials that once exhausted are replaced either not at all, such as coal, clay and the ores of the metals, or replaced very slowly, such as the forests. It is a curious circumstance that the greatest care in using everything usable should be seen in the packing-houses, where the materials come forward every one or two or three years with regularity and precision, while the least care is shown in dealing with materials that once consumed are gone forever, or recoup themselves once in a generation or so at best. If we could recover from a pound of coal or a pound of iron ore or a big tree as much, in proportion, as the packing-house recovers from a battleship hog, we would hear a great deal less about the diminution of our natural resources. If we paid as much attention to searching out new deposits of the useful minerals, or to devising schemes for utilizing the old ones to better advantage, there would be more work for geological surveys and technical bureaus and less work for the manufacturer of scarehead type. If we knew more about what we have we would known a great deal more about using it to the best advantage.

It is just here that the importance of geological surveys and their necessary adjuncts, bureaus for technical research, becomes apparent, even to those who regard a geologist with ill-concealed scorn. Too much, it may be, has he busied himself with the fossils of long past ages and too little with the needs of the present hour; too much with tracing the line of contact between the Permian and the Carboniferous and too little with mapping and studying the coal seams; too much with fauna and too little with fuel.

But that day has happily gone by, and it is to the credit of modern geologists that they are applying themselves with greater and greater zeal to the insistent demands of every-day life. We can in nowise disparage the labors of the paleontologist, for he determines for us the horizons within which we may expect to find such and such conditions. He is the forerunner of the miner and the firm friend of the engineer. If he tells us that this is Permian, and outside of the coal area, we accept his dictum and put our borehole down somewhere else. If he tells us that such and such fossils characterize the horizon of the phosphate rock in Tennessee, we hunt for them elsewhere, other conditions being favorable. Long life to him and many happy days amidst the shells and corals and other "critters" of the past.

But the concern of the general public with geological surveys is the concern of a man who is paying for something that he expects will benefit him. That man is not so much interested in the fossils which mark a certain horizon as in the materials to be obtained from that horizon and turned into money. He is willing that the age of the horizon be determined, provided the information can be used as a means to an end. Has he reason to suspect the existence of coal under his property? Then he wants to know all that can be told about it, how deep it is, what the quality of the coal may be expected to be, how thick the seam is and what it will cost to prospect it. Has he a fine deposit of clay? Then he wants to know what it is good for, whether for fire-brick, or stoneware and pottery, for the weighting of paper or the best grades of white ware. Is it salt, or sulphur, or gypsum, or iron ore? He wants to know, and the State is charged with the duty of telling him. This is the duty of the State, for the mere fact that it guarantees to him the peaceful possession of his life and property carries with it the obligation to improve the conditions under which he exists and point out to him how his property may be increased. It is not the duty of the State or of any creature of the State to open the coal mine, to dig the clay or iron ore and turn over to the citizen the proceeds thereof. This is to be left to individual effort. The duty of the State ends where individual effort begins; it ends when all reasonable information has been given.

It is in the highest sense obligatory upon the State to inform its citizens, the nation and the outside world as to what its material resources are and how they may be utilized with the least waste. If this nation is rich and powerful it is because the States comprising it are rich and powerful. If a State possessing supposedly great natural resources refuses to inquire into them, by just so much does it weaken the nation; by just so much does it render null and void all attempts to strike a national trial balance. It is quite beside the mark to say that the Federal Government should undertake these investigations, and for the reason that it does not profit, save in a remote manner, by the developments within State lines. The upbuilding of industries within a State is primarily of the greatest possible value to the State. The benefits accruing to the Federal Government, while positive and lasting, are remote. The increase of revenue, the betterment of all social and economic conditions, the uplift to a higher plane of life, are all in and for the State. All of this has nothing to do with the doctrine of States' Rights, a doctrine more of academic than of practical interest. It can take care of itself and fight its own battles. But it seems to me that the right to exist as a separate State carries with it the imperative call to provide adequate information to the citizens in regard to the living conditions within that State.

Geological surveys are not to confine their labors to tracing out the relationships between strata, or to affixing wonderfully big names to wonderfully little things. Rightly understood, they are to deal with all the complex affairs of rocks and clays, and oils and ores, and phosphate rocks and coal, and artesian water and soil surveys. They have jurisdiction over the products of the earth, but not the products of the soil. The earth and the fullness thereof is theirs, but not the cattle upon a thousand hills or the crops that wave over a thousand valleys. The Bureau of Animal Industry and the Department of Agriculture can look after these.

Of all portions of our country, and it is a great and a beautiful country, these United States of America, there is no part that needs the help of geological surveys as much as the South and Southwest. Here Nature has been most prodigal of her gifts, and here has man been least appreciative of them. Here has Nature conjoined a beneficent climate with vast stores of dormant wealth, and here have we basked in the one and bragged about the other, blaming the long-ignored hookworm for an indifference that would be absurd if it were not pathetic.

We applaud the eloquence at conservation meetings and weep over the waste that is so truthfully portrayed, but we spend not a dollar to decrease that waste or to search out things that are to take the place of what is destroyed. The great deposits of iron ore are fast being depleted. Are there deposits in Tennessee, or Alabama, or Texas that can be the basis of an industry which, above all others, has made this country rich? The coal is being used up at the rate of nearly 50,000 tons an hour. Are there other supplies that will give us as good fuel as that which we have used?

The phosphate rocks of South Carolina, Florida and Tennessee are not to last forever. Are we searching for others?

The oil fields of Texas, Oklahoma and Louisiana, with their associated gas fields, are not a widow's cruse of oil. Are we looking for others?

A few eminent men in the Southern States, working with meager appropriations and inadequate equipment, have accomplished a great deal. Clark, in Maryland; Rogers and Watson, in Virginia; Kerr, Holmes and Pratt, in North Carolina; Safford, in Ten-

nessee; Yeates and McCalley, in Georgia; Smith, McCalley and Prouty, in Alabama; Hildegard and others, in Mississippi; Harris, in Louisiana; Hill, Dumble, Comstock, von Streeurwitz, Cummins and Udden, in Texas; Branner, Penrose and Simonds, in Arkansas—these are some of the names that occur at first hand. They have done an honorable work, and no industrial history of these States can be written without according to them the highest praise. Of all of these, Smith of Alabama is easily the dean, both by reason of his long service (37 years) and his numberless contributions to geology and technical matters; a man in whom merit and modesty meet on equal terms, unassuming, indefatigable, an encyclopedia of information concerning the State whose renown is largely due to his personal labors.

It is to be supposed that one's active interest is given to matters with which he is in more immediate touch. For this reason I desire more particularly to speak of the relations of a geological and technical survey to the State of Texas.

Disregarding the earlier attempts at such work, although the Shumards accomplished not a little prior to the Civil War, the Texas Geological Survey, 1888-1892, was the first systematic effort to study the State as a whole. A great deal was done, chiefly as foundation work, and four annual reports were issued. Two excellent special reports were also published, "Brown Coal and Lignite," by E. T. Dumble, head of the survey, and "The Iron Ores of East Texas," by William Kennedy. These were of an economic character, and would doubtless have been followed by others of like import had not the survey, most unfortunately, been discontinued by the Legislature in 1892. The reports of this survey are now out of print and very scarce.

From 1892 until 1901 there was no effort on the part of the State to investigate any of its resources. In this year there was established the University of Texas Mineral Survey, by direct appropriation, the fund being administered by the Board of Regents. It continued in existence for four years, when it also failed to receive the support of the Legislature and was forced to suspend operations. During its existence it issued nine bulletins dealing with the mineral resources of the State and distributed more than 60,000 copies of them. These bulletins also are now out of print and very scarce.

During the last 40 years Texas has maintained a geological and mineral survey for but eight years, while in Alabama the survey has had an uninterrupted existence since 1872.

What has the country at large not seen of progress and prosperity during these 40 years! What developments in coal and clay and iron ore and the precious and semi-precious metals!

In the year 1882 the total value of all of the metallic and non-metallic products of the United States was given as $453,912,406, while in the year 1907 the value had risen to $2,069,289,196.

Since the history of civilization began to be written there has not been seen such a development and such a utilization of mineral wealth as has been seen in the United States during these 27 years. For each one of these years the increase in value has been $63,532,474, or about $174,000 a day for the entire period of 9855 days. During this same period there has been the most wonderful development along all the lines of geological and technical research; scientific schools have multiplied on every hand to provide trained men, and railroads have been built to carry the products of the earth to profitable markets. It has been a period of the most intense activity, based upon what the geologist and the engineer have discovered and brought into use. How anyone who is at all acquainted with the history of the country can refuse to accord the highest praise to the geologist and the engineer is past comprehension. Is it not time for us to awake to the true situation, to acknowledge the immense debt we owe these men and to make suitable provision for the furtherance of their work?

Here is the vast empire of Texas, with a known coal and lignite area of 10,200 square miles and a possible area of 58,300 square miles in addition; with fields of iron ore within $1 a ton freight rate to the Gulf; with every variety of clay known to the potter and the brickmaker; with the richest quicksilver district on this continent; with great stores of oil and natural gas, and cement rock and gypsum, and salt and sulphur! And yet it has maintained a survey for the purpose of giving accurate and impartial information but eight years in the last generation and a third. It has appointed, and rightly, too, a Conservation Commission to prepare plans for conserving what it really knows very little about. It locks the door on a horse it has scarcely seen and trusts to a beneficent Providence that he is not spavined. There is not a State in the Union that needs a geological survey, with its necessary adjunct, a bureau of technical research, one-half as much as Texas does, nor one that would reap so great a profit from it. How stands Texas in the matter of mineral production? Does it raise aught but cotton and cattle?

The following tabular statement shows the value of the mineral products of Texas through the year 1907, so far as can now be ascertained:

Clay products, including brick, tile and pottery, 1882-1907	$26,299,071
Coal and lignite, 1883-1907	28,391,760
Mineral waters, 1889-1907	2,011,603
Petroleum, 1889-1907	47,247,514
Pig-iron, 1872-1907	2,850,820
Quicksilver, 1899-1907	1,511,453
Salt, 1892-1907	2,148,205
Silver, 1886-1907	5,775,241
Stone (granite, limestone and sandstone), 1889-1907	5,775,732
	$122,011,399

This is a very respectable total for a State that is not ordinarily considered as a mineral-producing State. If to this amount be added the values for the years 1908 and 1909, the grand total will be about $160,000,000. If there has been so large a development of the mineral resources of Texas as a result of eight years of geological and technical work during the last 40 years, what may we not reasonably expect during the next decade if there were a well-equipped survey? Has the public in this vast region, which has already contributed $160,000,000 to the wealth of the nation, no further interest in the matter? Are the deposits of clay, which have yielded $26,299,071, to be no further investigated? Is the coal and lignite area of nearly 60,000 square miles to remain undeveloped? Are the great artesian water districts, affording supplies of water that bring countless acres into cultivation and people this region with thrifty inhabitants to remain unexplored?

What has this empire of a State spent on geological and technical work during the last 40 years? The total appropriations have been about $250,000, or about 94 cents per square mile of area. How much has been spent in the investigation of the lands belonging to the Public School Fund and reserved as a heritage for future generations? If we allow that these lands now comprise 20,000,000 acres, and that the entire appropriation of $250,000 during the last 40 years had been expended on them, a supposition very remote from the truth, it would amount to 1¼ cents per acre. Not 1¼ cents per acre per annum, but 1¼ cents per acre during the period of 40 years. As a matter of fact, the expenditures have been much less than this.

Has the public no concern in this? There are areas in West Texas belonging to the Public School Fund on which there are known to be deposits of quicksilver, copper, zinc, lead, building stones, sulphur and coal. Has the public no concern in this? The Texas Geological Survey, between the years 1888 and 1892, and the University Mineral Survey, between the years 1901 and 1905, did a great deal of work in this region, but each of these surveys was compelled to abandon its investigations because of lack of support. These surveys found areas rich in possibilities and laid the foundations for careful study of them, but the appropriations were withdrawn and the work ceased.

Conserve our natural resources? Surely. But would it not be much more to the point to know just what we have to conserve? We can restrict waste only after we know what we have to work on.

IMMENSITY OF TAMPA'S CIGAR INDUSTRY.

By WILLIS B. POWELL, Secretary Tampa Board of Trade.

[Written for the Manufacturers' Record.]

One million cigars a day! One cannot conceive of the immensity of the output, for the American public talks in millions on so many subjects that the figures have lost their significance. But 1,000,000 cigars have been the daily output of the 180 factories located at Tampa, Fla., during the year just closed.

Reducing the figures to commonplaces, let us say that the daily output would make a cigar which could be held in the mouth of a citizen of Baltimore and would have to

TYPICAL RESIDENCES OF CIGARMAKERS.

be lighted by a man in Philadelphia. If the yearly output was laid end to end, it would make a cigar over 20,000 miles long.

Today Tampa is recognized as the clear Havana cigar center of the world. There are made in Tampa more Havana cigars than in the Isle of Cuba and Key West combined. That this business is firmly established in Tampa goes without argument,

SHOWING CHARACTER OF THE TOBACCO FACTORIES.

inasmuch as at the present time the big New York concern of Regensburg & Sons is erecting a factory to employ 900 cigarmakers—the largest factory of its kind in the world, being some feet larger than that of Santaella & Co., which formerly had this distinction. At the present writing a score of new factories are being erected, and negotiations are on foot for establishing in this city a number of large factories from Key West, Philadelphia, New York and other cities. As the Philadelphia concern wrote, "We are obliged to have a factory at Tampa, as it is impossible for us to

compete in the clear Havana cigar business and not have Tampa Cuban-made cigars."

It is believed that in 1910 the output from the Tampa factories will exceed the 1909 output by 100,000,000 or more cigars, as the 1909 output exceeded that of 1908 by 50,000,000.

A realization that Tampa was the logical place for the cigar industry, that climatic conditions were correct for the handling of the tobacco to the best advantage, and that more working days were possible by reason of these proper climatic conditions came about by chance some 20 years ago.

Don Gavino Gutierrez of New York was an importer of foreign delicacies for the American market. Among the articles he sought to buy and sell were the product of the guava. He heard that there were great plantations of the guava in and about Tampa. He came here and was disappointed in finding that the guava was not cultivated to any extent. But he was impressed with the location of Tampa and its charming climate. He started home by way of Key West, and there renewed his acquaintance with two compatriots, V. Martinez-Ybor and Ignacio Haya, who had migrated from Havana to Key West with their factories and workmen to escape the oppression of Spanish rule of Cuba. These men were discontented, and Gutierrez told them of Tampa. The party came on to Tampa and also visited other Florida towns, looking for a location. Returning to Tampa en route to Key West, they met W. B. Henderson, who heard of their quest, and he promptly offered them all the land they desired to erect their factories and to furnish every cent of capital needed to transplant their factories to Tampa.

These gentlemen came, bringing with them their workmen. The Cubans found here a climate and a condition which suited their tastes, and they poured into Tampa by thousands; and, as the workmen had come to Tampa, the factories had to follow them. Today these Cubans are still coming, and with them new factories.

WHERE IMPORTED CUBAN TOBACCO IS STORED.

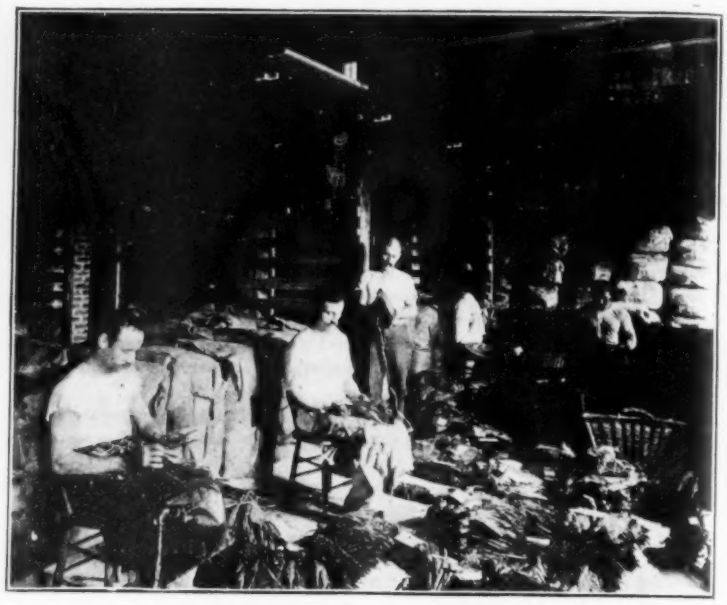
UNBALING TOBACCO IN THE BASEMENT.

As an example of the immensity of the cigar industry in Tampa, I cite here an incident. When Key West was devastated by a storm some months ago and hundreds of cigarmakers were thrown out of employment, the Tampa houses, through their association, offered temporary work to every idle man—2500 or more.

There are nearly 200 cigar factories in Tampa, including the small ones which are called "Buckeyes." They employ some 13,000 people. There are over 7000 cigar rollers, who make from $18 to $50 a week salaries. They work by the piece, the scale running from $18 to $100 per 1000 cigars. The average aggregate wage of the employes is about $230,000 per week. Their product is disposed of for $500,000 per week, or $26,000,000 a year. The cost of the raw material is more than $10,000,000 a year.

The price of the "seconds" is $35 per 1000. The prices of clear Havanas range from $85 to $1000 per 1000. The latter price is for the very highest-grade goods, and workmen receive more for rolling the cigar than the average business man would pay for a smoke.

Tobacco is an article upon which the Federal Government lays heavy taxes, both customs and internal. The utmost care is exercised to secure these taxes, and every pound of tobacco is traced from the point of receipt to the box in which it is, duly stamped for internal revenue, consigned to the dealer for disposal to the public. Therefore the figures of the customs and internal revenue collection offices afford a sure and conclusive guide to the quantity of tobacco imported and the number of cigars made and sold. These figures for the past 13 years are here introduced to corroborate the statements made as to the immensity of the cigar industry in Tampa. The custom receipts at Tampa for 13 years (last two weeks of 1909 estimated) have been as follows:



SELECTORS AT WORK IN THE TOBACCO.

1897	$638,515
1898	352,336
1899	530,128
1900	871,377
1901	865,400
1902	1,250,894
1903	1,318,531
1904	1,501,589
1905	1,604,829
1906	1,764,547
1907	1,687,509
1908	1,581,390
1909	1,964,128

The receipts of the internal revenue office in the city for the same years have been:

1897	$280,205
1898	331,079
1899	441,345
1900	496,560
1901	498,110
1902	442,767
1903	510,066
1904	596,252
1905	689,124
1906	851,450
1907	865,316
1908	731,048
1909	898,993

The number of cigars made and shipped from Tampa in the same period (last two weeks of 1909 estimated) have been:

1897	90,408,000
1898	85,114,000
1899	111,670,000
1900	147,848,000
1901	147,330,000
1902	141,905,000
1903	167,630,000
1904	196,961,500
1905	220,430,000
1906	277,662,000
1907	285,660,300
1908	236,681,000
1909	288,000,000

The cigar factories of Tampa are models of cleanliness, well lighted and ventilated. The sanitary conditions are the best, and have been approved by the State Board of Health. The floors are clean and free from litter. The work benches are as neat as a good housewife's kitchen table or bread board. No workmen in any way diseased or with pulmonary troubles are allowed to work in the factories. The Tampa-made cigar, in quality of material and detail of manufacture, cannot be excelled, and in fragrance is a perfect nosegay.

The factories are modern in every detail, having improved methods of handling the raw material in bales down chutes to the basement, where the atmosphere is kept at the proper humidity, thence by elevators to the top floor, to be selected and blended, and thence down chutes to the selectors, and the rolled cigars are carried to the stock cases, where they remain until the "sizers" and "assorters" pass them over to the "banders" and "packers," and then the box, properly labeled, is again returned to the cabinet, awaiting the "shippers." The labels used on high-priced goods are works of art, done in as many as 10 colors, embossed, etc. The man who smokes high-priced cigars has a pretty bill to pay for the pretty label.

In this connection I desire to state that there is a good field open in Tampa for

a high-class lithograph-printing plant. The cigar-box plants, making hundreds of thousands of cigar boxes, have done well here. There is no reason that the printing of labels should not be done in Tampa.

One of the novelties to be found in the cigar factory not to be found in any other manufacturing plant is the "reader," who, perched in a balcony above the heads of the hundreds of silent workmen, without the purr of machinery, reads from the local papers the current news, translating as he proceeds; reads the Cuban and Spanish papers, novels, etc. He is paid by the workmen by subscription, and some readers earn as high as $150 a week. They cannot read continuously, as the tobacco dust and the loud tone in which they read affect their voices.

While the cigar business is the principal one of Tampa, there are other factories, namely, brewery, bottling works, two fertilizer factories, candy factory, woodworking concerns, marine works, etc. It is estimated that $400,000 are paid in wages each Saturday to the factory employes of Tampa and the mechanics and artisans and dock laborers.

LOUISIANA SWAMP LAND RECLAMATION.

By EDWARD WISNER of New Orleans.

[Written for the Manufacturers' Record.]

Undoubtedly the drainage of the swamps and marshes of the eastern portion of the United States is to become the next great feature of national land development. The arid West has been pretty well exploited and the easy and cheap propositions have been taken. It happens that the great bodies of wet land left are in the South. Florida, Louisiana and the Carolinas contain the great swamps of the country, and in all of these States the movement toward reclamation is strong and is gaining momentum.

Of course, in any new development it takes a certain amount of talk and agitation, and this always precedes actual work. But the period of agitation is practically over and the actual development has begun on practically all of the remaining great swamps of the country. As the preliminary agitation was first started in Louisiana and Florida, so more actual construction work has been done in these States, but reports from both North and South Carolina indicate that these States will not lag far behind.

SOD CORN ON DRAINED LAND.

NINETY-POUND WATERMELON GROWN ON DRAINED LAND.

In the Florida Everglades ex-Governor Broward is a leader in the reclamation work. To him belongs the credit of being the first man in public life to see and seize upon the great opportunity offered in wet land reclamation, and the State of Florida owes him a debt of gratitude which in time it will no doubt repay.

In Louisiana the reclamation work has progressed steadily, and is receiving the attention of people in all parts of the country. No new projects have been started, but several important interests are assembling machinery and forces to begin actual construction work early in the coming year.

One of the largest and best sales of raw land made since the wet prairie lands have reached a value was made to Frederick Scully, son of the late Frederick Scully, who was one of the largest landowners of the corn belt of the Middle West.

This year was so far the most important in the way of the actual cultivation of reclaimed prairie lands. A considerable area was planted in both cane and corn. Both crops were excellent. This, with the former years of trial on a smaller scale, proves beyond a question that these new and marvelously fertile lands are great in the production of anything which grows in this latitude. The cane produced about twice the average tonnage of the older lands, and the results in corn clearly indicate that the 5,000,000 acres of wet land around New Orleans can become the new corn belt of the United States, equalling the best results in the great corn belt of the Middle West. This is a matter of great economic importance to the United States, for practically all of the good corn lands of the country aside from these have been fully exploited, and the price tendency during the past few years indicate that we are fast reaching the limit of corn production, and corn means meat and all manner of animal food products.

The capacity of this new land for corn and other staple products also has an important bearing on the future of South Louisiana. As is well known, cane sugar as an industry in the United States is dependent upon a protective tariff, and the sugar producers are periodically thrown into a fever of excitement by threatened tariff changes. Therefore, a demonstration that the sugar lands are immediately available for the greatest of all standard crops—corn—a crop which has made rich the most prosperous and stable portion of the Central West, is a matter of much import.

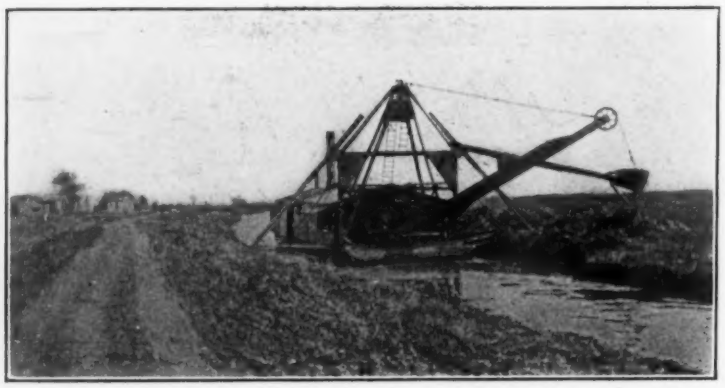
Undoubtedly the reclamation of the great swamps and marshes should have preceded arid land reclamation. The wet lands are, as a rule, adjacent to great centers of population, and with transportation and markets close at hand. The arid lands are, as a rule, remote from the great markets of the country, and in most cases dependent on a single line of railway, and in many instances a long haul to that. But no regrets over what ought to have been will avail. The wet land reclamation work is on. It is more important because the acreage to be drained is greater than that to be irrigated and the drained lands are equally valuable. In their capacity to produce food and clothing for the oncoming millions the wet lands have a far greater capacity than the lands already in cultivation, because they are the great reservoirs of plant food. Once in cultivation, they could support in comfort the population of Great Britain or France, and will at least provide homes and sustenance for the normal increase of population in the United States for a generation to come. Thus it seems to me that the question of wet land reclamation becomes one of national import. It answers for the immediate future the question of a new food supply which is yearly becoming more pressing for the world at large. In the South it means a greater prosperity than she has ever known. The unused wet lands of the South are her greatest asset and her population will double and her wealth multiply when they are in use.

Periodically and spasmodically arises the demand that the General Government take hold of swamp land reclamation, but I believe that any section which waits on the expectation that the General Government will do this work is simply wasting time, and, indeed, there is no reason why the Government, particularly the United States Government, should concern itself about the matter at all. It does not own any of these swamps. It parted with its title to them more than a half-century ago, and besides there are no inherent difficulties about swamp land reclamation which call for Government intervention. The work has now progressed so far, the demonstrations of the safety and profit are so thorough that private or corporate capital will furnish the

necessary sinews and the thing will be accomplished more quickly and with far greater economy than the Government is wont to do such things. Unless all signs fail, the Government will get its fill of land reclamation work in the arid West. Already the inevitable waste and scandal are showing up. A loud call for more money is now going

GODCHAUX SUGAR REFINERY, RACELAND, LA.

THRESHING RICE IN LOUISIANA FIELDS.



SHOWING THE EASE OF DRAINAGE WORK.

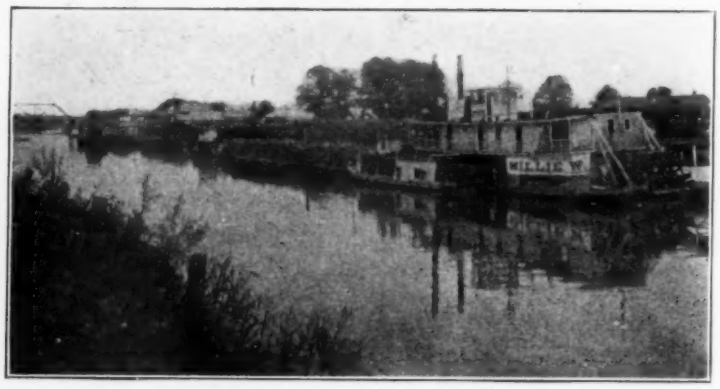
A VIEW OF BOATS LOADING TRUCK.

up to Washington, the work is proving more costly than the engineers estimated and far more costly than the projects under private control. And this result is exactly in line with the expectations of all students of Government operations in the domain of business.

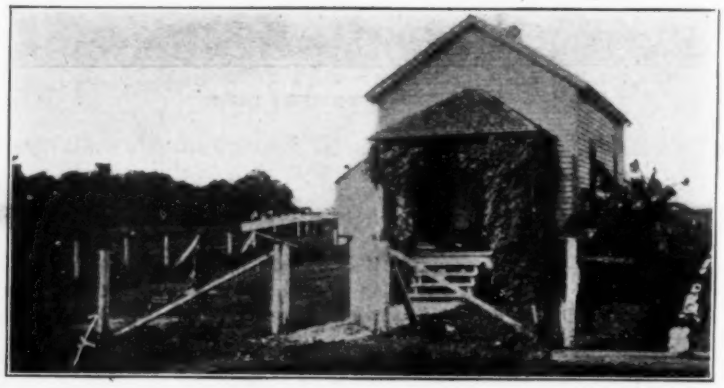
One of the beneficial results of land reclamation in Louisiana will be the revolution of social and business conditions in the southern part of the State and in the city of New Orleans. South Louisiana is today a land of baronial estates with the great landlords who are quite as much monarchs of all they survey as were the feudal lords of Europe. While the laborers who do the work are not to be classed with the serfs, they

PLOWING GROUND FOR PLANTING.

ONE CROP OF THESE ONIONS MORE THAN PAYS FOR THE LAND.



GASOLINE BOATS AND BARGES FURNISH CHEAP TRANSPORTATION.



A HOME ON LAND DRAINED LESS THAN A YEAR BEFORE.

are completely dependent and utterly unable to acquire any land for themselves under present conditions. With the reclamation and placing on the market the new lands the more thrifty of the laboring class will buy homes for themselves, and this will lead to the ultimate breaking up of the big plantations, and instead of a mass composed of tenant farmers and day laborers, South Louisiana will have an independent and vigor-

ous "middle class," which is so essential in any free community. And I suspect the fear of this outcome is largely the secret of the opposition shown by many planters to the bringing of new lands under cultivation.

Upon the city of New Orleans itself the effect will be quite as important. New Orleans has always brought its food supply from a long distance, and as a consequence the cost of living for the poor of this city is and always has been relatively high. Now, it happens that New Orleans is surrounded by 5,000,000 acres of unusued fertile land, which contain more food-producing capacity than any equal area in all the world. When these acres are reclaimed and producing food and clothing New Orleans should and will be one of the cheapest places in which to subsist. Practically everything grown in the United States, except wheat and apples, are adapted to this soil and climate, and in no other section are such magnificent results obtained from the cultivation of the soil. Before New Orleans can attain her manifest destiny, i. e., the position as one of the three great cities of North America, she must have such a supply of food adjacent. This she will get through land reclamation, and in no other way, and important as may be the Panama Canal and the Lakes-to-the-Gulf deep waterway, neither of these projects rank in importance with the making of farms out of the great swamp which surrounds the city on all sides.

In this connection it is, perhaps, well to call attention to the difference between the swamps and marshes of this lower delta and other great swamps of the United States.

CABBAGE PATCH, RACELAND, LA.

TRACTION MACHINE USED FOR CULTI VATING, PLANTING AND HARVESTING.

Most swamp lands contain much plant food, and when they have a good subsoil are sure to make a lasting soil. But there is no other large swamp in North America that contains so perfectly a balanced soil as does this. Nowhere else are found humus and river washings so thoroughly mixed. While the humus was forming by the decay of animal plants and grasses, the Mississippi River was each year depositing the silt brought down from the entire valley. This silt contained clay, sand, lime, potash and all other soil elements from the fertile plains between the Allegheny and Rocky Mountains. We have, therefore, the most perfectly balanced soil to be found anywhere, a soil of great depth, and one which is prolific in both plant growth, with substance enough to stand up well and to produce the fruit as well as the plant. No superlative can be extravagant enough when describing this soil. Its equal in a like quantity does not exist elsewhere on the globe. And lying, as it does, in a warm, moist climate, its wealth-producing power is likely to be under rather than overestimated. Secretary of Agriculture James Wilson, in his annual report, says:

"A great fundamental problem which has confronted our people, as it has the people of the world, is the question of the permanency of soil fertility."

However much this question may bother other people, it will be a century at least before it will arise here, so far as the newly reclaimed lands are concerned.

One other point I wish to touch upon is the wide range of products which flourish so well here. We have four great staples—sugar, corn, cotton and rice. Sugar will no doubt be the great staple here so long as a protective tariff is maintained, because it is the most profitable crop grown in the United States.

Corn will be grown in increasing quantities because it produces well and its continually advancing price is likely to make it too expensive for the planter to buy. Cotton has never been grown extensively in the lower delta, but that is because sugar pays better, but experiments have proved that Sea Island cotton is at home on the moist bottom lands near the salt water, and without doubt the high price of this variety will cause an extensive Sea Island cotton industry to arise here when sufficient land has been reclaimed to meet the demand for sugar. Rice has been grown here for many years, but it, like short-staple cotton, cannot compete with sugar from the standpoint of profit, but it will always be a possibility, and a great one, in case anything should happen to the sugar industry. In addition to the above great staples these rich lands produce in profusion everything in the way of vegetables and subtropical fruits, and besides it is a splendid stock country, and is adapted to all classes of farm animals except sheep.

Perhaps the most notable development of the year has been the change in public sentiment on land reclamation in New Orleans and South Louisiana. From pessimism and active hostility on the part of a major portion of the resident population, public sentiment has passed to an enthusiastic endorsement of the reclamation work. And this is most important, because no matter how meritorious a proposition may be, it is extremely difficult to conduct a great enterprise in the face of local opposition. All in all, I think those engaged in wet land reclamation may feel much encouraged. The work of securing public recognition has been a long and arduous one, but it is now accomplished, and the work will now proceed not only more rapidly, but with much

CATTLE FEEDING, PARADIS, LA.

WATERMELONS FROM RECENTLY DRAINED LANDS NEAR LOCKPORT, LA.

greater ease, and the Lower Mississippi delta is soon to take rank with Holland and Egypt, if, indeed, it does not outrank them both.

Lumber and General Conditions in the Southwest.

By J. C. Dionne, Editor *Southern Industrial and Lumber Review*, Houston, Tex.

[Written for the Manufacturers' Record.]

The lumber industry, the greatest manufacturing industry of the Southwest territory, is still in the grasp of a business depression that started in October, 1907, and continued without intermission up to the present day. The history of the yellow pine industry in Texas and Louisiana since that time could only be illustrated by a series of kaleidoscopic views, so swift has been the change in program from week to week, and so unusual, remarkable and altogether regrettable the series of causes that have contributed toward this long-continued run of adversity, when every other industry except lumber has entirely recovered from the fearful effects of the late panic, and are again approaching the crest of the wave of success.

To secure a rightful view of the situation, the causes and effects, one must start back as far as the spring of the year 1905. At that time the most remarkable improvement in lumber prices of which the lumber records of the country can show, started in yellow pine. Beginning in March of that year every week marked a succession of improvements in both the demand and the price of yellow pine. The prices of yard stock and railroad material went up several dollars a thousand in two months, and the mills

started running nights to supply the demand that was depleting their stocks and straining their shipping capacities to the utmost. Everything fairly hummed in the lumber world. This reign of prosperity continued through 1905 and increased in 1906. The railroads of the country bought fabulous amounts of yellow pine, and paid fabulous prices for it. Yard stock was at a premium both in the Texas and the general markets, and it waxed strong in price. Export material was in great demand, and the European and other foreign markets cried for American yellow pine. It was the kind of market that spoils manufacturers for lesser things and makes it difficult to go back to the everyday things of life. The followers of the industry failed to realize that the demand and the prices were abnormal. They had no time to look up the rule of cause and effect; they were busy trying to make the supply equal the demand.

The spring of 1907 showed a continuation of these conditions, and more than two years of affluence had made the manufacturers believe that yellow pine had come to its own, and could do nothing but improve in the market division.

However, during the period just covered many changes had been made in the manufacturing capacity of the yellow pine territory. It is human nature to take advantage of a good thing, and everyone soon learned that yellow pine was a good thing from 1905 to the middle of 1907. It looked so good that everyone that could do so flocked into the lumber business, despite any lack of ability in lumbering. New mills sprang up in a night. Railroads that had been lined with a few mills found themselves fairly dotted with mills. Those who had been manufacturing pine placed electric-light plants in their mills and ran nights as well as days. They also built new mills and increased the capacities of old ones. Such was the rush into the lumber manufacturing business, and in two years' time the manufacturing capacity of the Southwestern sawmills had been almost doubled.

As lumber increased in price, so did timber. In 1904 big tracts of Texas pine were bought for 50 cents a thousand feet. In 1907 they were already figuring that pine in solid tracts was worth from $4 to $5 per thousand feet. As timber must be had to operate sawmills, everybody bought timber. The rush of buyers jumped prices to top notches. Mill men who had $1000 in the bank borrowed $9000 and bought $10,000 worth of timber, giving a nine-thousand-dollar mortgage on the property to safeguard the loan. This was done on all sides. Those who had been absolutely out of debt before the rise in the price of lumber found themselves far in debt in 1907. But they knew that at the rate lumber was selling they could pay their debts easily and make a fortune from the investment which had caused the indebtedness. The consequence was that when the panic struck the country it found the lumber manufacturers of the Southwest entirely unprepared for any such event.

Beginning in June, 1907, the demand began to slacken. Then the manufacturers began making excuses to explain why such was the case. They were forced to keep on making excuses for fully two years, and finally found out that explanations were vain and prophecies unavailing, and they have quit playing in futures entirely. In October, 1907, things were rather slack, but everyone was happy and confident that every coming week would bring a renewal of the demand for stock, and they heaped it up in their yards in anticipation of that event. Alas, it was never to come.

In October, 1907, the panic appeared, and the bottom fell out of lumber. It was the worst blow that any industry in the nation received, without a doubt. No others suffered like the lumbermen. None was in such absolutely bad shape to withstand such a shock. In one week's time yellow pine dropped $5 a thousand. Nothing worse could be imagined. It was so stunning that not a man in the Southwest realized what it meant. For about 30 days it was freely predicted that before the first of the year 1908 the market would assume its former shape. At the end of 30 days lumber was worth from $7 to $8 per thousand less than it had been before the panic, and there was absolutely no demand. Lumber could not be sold at any price. Then the mills began to shut down. They started by ones and twos, but followed by the dozen, and the first of January, 1908, saw practically every mill in the Southwestern yellow pine district shut down.

In April there was some little demand for lumber, and some of the mills started. No night runs were attempted. Lumber was woefully cheap, but there was untold millions on the yards begging for buyers, and it had to be sold. By July there was an accelerated demand for lumber, and prices were increasing. By the first of September lumber had reached a point where the manufacturers were getting within $3 per thousand of what they had been before the panic. No hint had been heard of a possible overproduction. Everyone took it for granted that what the country had once bought it would buy again, and the return of great prosperity was freely predicted.

Then things began slipping. The demand slackened. The prices weakened. They continued to do so from September, 1908, to April, 1909, and by that time matters had reverted to almost panic conditions. During this time the manufacturers began to wonder if it were possible that there was too much lumber being made by a normal mill production to supply a normal demand. Some believed this was the case. Others doubted. It came to a show-down, however, and the mills quit running nights, as many had again been doing, and most of them started running less than six days a week for puposes of curtailment.

This reduction and the natural improvement of the spring demand caused an improved demand and an increased price. Curtailment continued until July. Lumber had increased considerably in price, so the mills started full time again. The effect was instantaneous. Lumber markets immediately weakened. Then the manufacturers looked each other in the eye and asked if it was possible that the market not only would not stand a double-shift run, but would not even stand the day operations of the mills. There was only one answer. Experience was showing them that a normal production of the mills was greater than a normal demand. Time had demonstrated that the return of the abnormal conditions that preceded the panic was out of the question. It was up to the lumbermen to work out their own salvation. They simply had to say, and they plainly did say, and still say, "there is too much lumber being manufactured."

Therefore, the greatest movement toward curtailment that is on the yellow pine record started in the Southwest, principally in Western Louisiana and Texas, with a few Arkansas mills joining. The plan generally adopted, and which has been followed by most of the big mills and many of the small ones of the district, is to run just two-thirds of single-shift time. Many accomplish this by naming two days in each week and shutting down voluntarily on those days every week. Others run two-thirds of the month and shut down the rest. Still others that have several plants shut down one or more of their plants in order to follow the example of their fellows, and make only two-thirds of a normal month's production. This campaign started on October 1.

Since last summer the market for yard stock has never strengthened any, and has had a difficult time holding its own. A bad crop throughout the State of Texas rendered the demand for lumber in this State less than it would be normally, and added to the trials of the lumbermen. Today yard stock is from $1 to $1.50 per thousand feet cheaper than it was in July of this year, and is about $4 per thousand feet cheaper on the average than it was previous to the panic.

While the yard stock market is weak, there are some bright spots on the horizon. For instance, the railroads, who bought fully 30 per cent. of all the yellow pine manufactured in 1906, and who practically stopped buying except what they absolutely had to have from the panic until the winter of 1909, have now re-entered the market in a way that is delighting the manufacturers. It is not by any means the sort of demand that marked the prepanic period, but is nevertheless wonderful as compared with what it has been for two years, and it appears to be strengthening. Practically all of the mills have good railroad material orders on their files, and they are getting better prices for this stock than for yard stock. The past 60 days has shown considerable improvement in this line, with a slight strengthening in price. The weak condition of the yard stock market has prevented much increase in the price of railroad stock, and at the same time the strength of the railroad material market has saved the yard stock from a severe drop in price.

Another item that is helping to keep up the general market is the demand for car material. For six months straight the demand for car lining, car siding, car decking and other lumber for the manufacture of railroad cars has been so great that the mills have been unable to fill the orders that have appeared, and at the present time this demand is greater than ever. It is said that there are millions of feet of car material orders going begging now. All the mills have contracted for as much of this stuff as they are safely able to produce, and since car material is something like porterhouse steak—that is, you have to kill a whole cow to get a small amount of steak—the manufacturers cannot afford to contract for too much of it, or they will overload their yards and sheds with the commoner grades while accumulating this. The future for the car material market looks good. The orders come from Chicago and farther east, and the price is increasing.

The export market is booming. It started to brighten up in the middle of the summer, and came out of the hole in which it had been for fully two years. On August 1 there were hundreds of millions of feet of square timber lying at the various docks between Galveston and New Orleans looking for buyers. Within 60 days this was all sold and shipped, and hundreds of millions more contracted for. The demand for Europe has not been satisfied by any means, and the market seems to be still improving.

These three elements—railroad material, car material and export material—are the saviors of the yellow pine market today, for there is no question that without the strength that has been shown in the demand for this stuff and the diverting of huge quantities of material in these various directions that would otherwise have gone into the yard stock market there is no question but that there would have been another case of the bottom falling out of the yellow pine market. The fact that the yard stock market has barely held its own, in spite of the curtailment and these three other elements, shows what might have happened.

The trouble is, no one knows what is going to happen. It can be fairly stated that during December the demand for yard stock has been brisk; in fact, has been of a kind that would have increased the price of the material under ordinary conditions. Conditions are far from ordinary, however. A number of different things that have aided overproduction in keeping up the cost of lumber are very interesting.

In the first place, it has been often asked the lumbermen of late why it is that they are unsatisfied with conditions now, when they are really getting more for their lumber than they did up to 1905, and they were well satisfied before that time. The first reason is that stumpage is too high, as compared with the years previous to 1905, to permit them to make anything under present conditions. In those days any amount of stumpage was bought for as low as 25 cents per thousand feet, and $1 was a good price. The prosperous times raised the price of stumpage as well as lumber, as has been shown, but when the price of lumber fell the price of stumpage remained at the highest notch. It could not fall. It was held up by the investments made in it, and by the money that was borrowed on it. That is the greatest reason the yellow piners fought for protected lumber. It was not free lumber they were afraid of half so much as they were of free timber. The price of lumber can lower without damage, but the finances of the country are entwined with the price of yellow pine stumpage in the Southwest, and they cannot be permitted to fall. Equalization with low-priced Canadian timber would have tended to lower the price of timber, which would have been disastrous to the owners of the many millions loaned on this timber at its highest value. Timber is worth $3.50 per thousand more than it was before 1905. Therefore, all else being equal, $3.50 would have to be added to the price secured in 1905 to show what the stuff must bring now to make the same return on the investment that was made then.

However, all other things are not equal. The addition of the sum mentioned alone would bring the price up higher than what lumber is bringing today, so the lumbermen had more cause to be satisfied in 1904 and previously than they have now. But at the same time all other expenses are greater. The wages of the Texas mill laborers are 50 per cent. higher today than they were five or six years ago. This is a great item. The cost of every department is higher. Every horse and mule costs more than it did then. Every bit of leather, every mill machine, every mill supply, every commissary supply is greater than it was then.

In addition to these things, another great cost has been added to the price of lumber, and that is, the additional cost of selling. A sales manager used to sit in his office and sell his stuff, and his own salary and office expense, with possibly, but not generally, one salesman on the road, was the total cost of selling the lumber. Today the man that sits in his office and waits for orders does not get them. The day of personal solicitation has arrived some time since in Texas, and the personal equation in lumber salesmanship is a very large one. Every field in which the mill man markets his stock must be covered by lumber salesmen today, and the country is filled with them. There are a hundred today where there was one five years ago, and the number is steadily increasing, as the mills find by bitter experience that if they want business they must go after it. It costs money to travel men, as lumber salesmen are well-paid employes, and their expenses are borne by the company. This is all added to the cost of the lumber, and it amounts to a great deal.

We have, therefore, given a number of first-class reasons why the lumber manufacturer today cannot make a living at prices that pleased him greatly five or more years

ago. It is very easily understood by everyone except peanut politicians who shout "Lumber Trust" for politics' sake and yellow journals whose space writers know no more about the subject than addle-pated parrots.

The enforcing of the sale of lumber personally has worked two ways: It has increased the cost of lumber, as was just shown, and it has decreased the price in the open market by overheated competition. In the first place, in getting together several hundred brand-new lumber salesmen in a year's time the lumber manufacturers have naturally had to hire many green ones and let them get experience on the road. Bad salesmanship is common in the Southwest for that reason, due to inability of many salesmen, while fully as much trouble is contributed by the manufacturers themselves in permitting their representatives to make low prices and establish the precedent of low prices, and no price ever gets too low for some other fellow to cut under; so the result is that prices are being held down every day that passes by frenzied salesmanship. When a retailer has an average of six traveling lumber salesmen a day call on him offering lumber for sale, his natural shrewdness teaches him to use them, one against the other, for the sake of getting cheaper lumber, and this is what is done continually. A well-known mill man expressed the belief recently that if all the traveling lumber salesmen were called off the road at once, and lumber sold only by mail for 30 days, the price would increase $2 a thousand in that time.

None of the conservative lumber manufacturers are willing to venture an opinion as to what the future holds for the industry. All are confident that time and the limitation of the supply will bring yellow pine to the crest of the wave some time in the future, but they have been fooled so often that they will not say when. Every year that passes marks the end of many sawmills in the Southwest that are cutting out and dropping from view, and at the same time there are many new mills building and many others planned. It is safe to say that in 1909 the new mills have more than equaled the capacities of those that closed for good. In the next two years, however, there will be a fearful falling off in the number of sawmills in Texas and Louisiana, especially Texas. It is likely that two years will see from 100 to 150 sawmills go down and out in this State. Beginning in 1910, the falling off in the sawmill capacity in Texas will be far greater than the new mills built. Three years' time should cut off a huge number of mills, and the law of supply and demand should then raise the price of lumber much higher than ever before.

But between now and that time there will be many strange things happening in the lumber business. While everyone hopes for the best, and trusts that the demand for railroad and export material will combine to boost the yard stock market and permit the mills to keep operating steadily, there are those who believe, and have grounds for believing, that the yellow pine yard stock market is not out of the deep hole into which it plunged when the panic struck the country.

THE PUBLIC ROAD SITUATION IN THE SOUTH.

By JOSEPH HYDE PRATT, State Geologist of North Carolina.

[Written for the Manufacturers' Record.]

The question of public road construction is one that has become very vital to the South, for upon its solution depends the industrial and educational progress of the Southern States. Where a few years ago the value of good roads to a community was the subject of violent debates, now it is accepted that they are to the best interests of a community, and the debatable question is, How can they be obtained most economically and to the best advantage to the community? There is hardly a section of the South at the present time in which the subject of good roads is not discussed and considered.

FIG. 1.—MACADAM ROAD IN DURHAM COUNTY ONE-HALF MILE EAST OF DURHAM, N. C.

While some communities are still raising serious objections to their construction, putting forth the plea that "the roads are good enough, we have got along with them for years and can get along with them now, and the old method of working the roads by labor tax is all right, we will not pay a cent of tax for roads," other communities are striving in every way to obtain a system of good roads that will connect all parts of their own territory with each other and also connect them with the good roads of other sections. One peculiar phase of the situation is that these two conditions often exist side by side, and illustrate the fact that when a people get into a rut in their manner of living and conducting business it often takes a long, tedious process of education to get them to give up their former methods and take hold of modern advancement, even when it is demonstrated on all sides that the new methods are better and will give them more comforts and more income.

Within the last 30 years two methods of transportation have been started that have had a very great influence on good-road construction in this country, i. e., the bicycle and the automobile. The effect of the bicycle was, perhaps, felt more in the North than in the South, but the influence of the automobile on good-road construction is being felt throughout the whole country. Its usefulness is being realized more and more, and some of those who have raised the loudest complaint against the automobile are now loud in its favor, for they have found that it is not simply a vehicle for pleasure and for the rich, but that it is capable of being utilized to very great advantage as a means of transportation of produce from farm to market and as a means by which a farmer can keep in close touch with city and market. Even now in certain rural sections of the South the farmer is utilizing the automobile to go to and fro between county and town. He is also realizing that the automobile can only be used to advantage on good roads, and thus every farmer who becomes interested in an automobile becomes a much stronger good-road enthusiast than he ever was before. While we will all admit that the automobile is still largely a vehicle of pleasure, yet its demand for good roads has

FIG. 2.—SAND CLAY ROAD NEAR NEWBERN, CRAVEN COUNTY, N. C.

done more in certain sections of the South to assure a working interest for good roads than any other one thing. For instance, the automobile tours that have been arranged by various Southern newspapers have caused many counties in Virginia, North Carolina, South Carolina and Georgia to repair their old roads and to construct new roads, which they would not have done if it had not been that they wanted the proposed automobile tour to pass through their county. The New York *Herald* and Atlanta *Journal* route from New York to Atlanta caused the following counties to do work on their roads that would not otherwise have been done: Rockbridge, Roanoke, Franklin and Henry counties, Virginia; Rockingham, Rowan and Gaston counties, North Carolina; Cherokee, Spartanburg and Greenville counties, South Carolina, and DeKalb county, Georgia. The capital-to-capital route has caused counties in other portions of these States to do good-road work, as Mecklenburg county, Virginia; Vance, Henderson, Wake, Moore and Rockingham counties, North Carolina; Marlow, Chesterfield and Darlington counties, South Carolina. Does such agitation pay? I believe it does. We need good roads, and whatever means used (as long as it is honorable) of arousing an

FIG. 3.—GRAVEL ROAD NEAR AUGUSTA, GA.

interest in good roads and causing them to be constructed in a community I am in favor of.

It seems to me that the time has come when it is necessary for all the States, in some form or other, to assist the counties in the construction of the public roads, although the largest share of the expense must be borne by the counties and townships, as the benefits to be derived from the construction of such roads in the various counties composing the State are not only of great value to the individual counties, but also to the State as a whole. There are three ways in which the States can assist the counties in good-road construction:

1. By appropriations to the counties for the actual construction of roads;
2. By giving to the county engineering assistance in the location and construction of the public roads; and
3. By using the State convicts in good-road construction.

Two of the Southern States, Virginia and Kentucky, are already assisting their counties in the construction of good roads by making a definite appropriation to the counties for this work, provided the counties themselves raise a certain amount for the

same purpose. In Virginia this method of State assistance has been in vogue for two years, and as far as I am able to ascertain, is working out very satisfactorily. North Carolina is considering a similar form of State aid. My idea of this form of State aid is not that the State shall obligate itself to construct the public roads of the State, but that for a certain number of years it will give to each county making a certain appropriation for public road construction a certain amount in order that good-road construction shall be begun in that particular county, believing if once begun in the right way that the county will not stop, but will continue the work.

Judging from inquiries made from other Southern States, I do not believe that any of them, except North Carolina, are at the present time in favor of this form of State aid to the counties.

2. I believe that the most satisfactory form of State aid to counties that will meet with most general approval in the Southern States will be engineering assistance to the counties. This form of State aid is needed in the majority of the counties throughout these States. If each State would create a highway engineering office and give to it sufficient appropriation to enable it to employ an adequate number of road and bridge

FIG. 4.—CONCRETE CULVERT USED IN ROAD CONSTRUCTION.

engineers to give the necessary engineering assistance that the counties need, it will be found that a very great advance will be made in good-road construction throughout these States. One of the most serious drawbacks to good-road construction that has been experienced in the South has been the waste of funds appropriated to good-road work on account of the inefficiency and incompetency of those in charge of the work. Many people have looked upon road construction as the simplest kind of work which could be done by almost anyone who had nothing else to do, or who had to be satisfied with some political appointment. This idea may have been brought out from the old method of road construction by the labor tax, in which system not only the foreman and overseer had certain ideas they wished to carry out, but nearly every man working out his tax had ideas that were largely put into practice. Road engineering is a profession that requires careful preparation and offers splendid opportunities to the competent man. The road must be located and grades kept down so as to permit hauling a maximum load over the road and also to preevnt wash; it must be drained and finally surfaced with some suitable material which will depend upon the location of the

FIG. 5.—KIND OF ROAD THEY ARE TRYING TO ELIMINATE IN THE SOUTH.

road, amount of travel over it, cost of material, etc. These questions must be solved by the road engineer. Mistakes are costly, as many a county in the South has found out, and the counties are beginning to find out that it is economy to employ competent road engineers to look after the construction of their public roads. This will be found true not only for the roads surfaced with macadam, sand-clay and gravel, but also in the counties where they have little or no roads surfaced with these materials. The demand for good engineers who are capable of handling these problems is increasing every day, and with the amount of road construction that is now being planned by the different Southern States there will be a continual demand for engineers of this type.

A county or township issuing $100,000 or more in bonds for road construction wishes to make that amount build just as many miles of good road as possible, and does not want to see any of the money wasted. The first thing to be done, and which most of our counties are now doing, is to employ a road engineer, and the county will hold him responsibie:

1. That the road is located in the right place.
2. That it has the proper grade.
3. That it is properly drained.
4. That it is surfaced with material suitable to the traffic over the road.
5. That culverts and bridges are put in the right places and constructed of the most suitable material.

The location of the road is really the only permanent part of the road, and the greatest care should be taken by the engineer to see that it is in the best place. Local influence regarding location should be given little or no consideration, and the road should be located where it will have the right grade at the least cost, can be maintained after construction at the least expense, and will suffer the least from wash. Many roads have been constructed in the South without proper regard for the location, and they have been built so as to pass certain men's houses, notwithstanding the fact that in doing this the roads were given a grade of 10 or more per cent. Where local men are in charge of the location of the roads it is very hard for them not to be influenced by their neighbors to the detriment of the roads. Where the State can give the counties engineering assistance the engineer in charge of the location of the road is not influenced by any local conditions, and his one idea is that the road shall be located in the right place.

North Carolina and Virginia are now giving engineering assistance to their counties, and they have been able in many instances to prevent a road from being located in the wrong place. It has been found that the people of a community are much quicker in taking the advice of the State highway engineer in regard to location of a road than they are of any local engineer.

3. The third form of State aid to counties is using the State convicts in good-road construction in the different counties, and this is being done by Virginia, North Carolina, Georgia and Florida. In all the Southern States, with the exception, perhaps, of Alabama, many of the counties work their convicts on the public roads. The system of working the State convicts on the public highways that is in force in Virginia, North Carolina and Georgia, the three States with which I am most familiar, I believe is to the best advantage to the State as well as to good-road construction within the State. There are, of course, some abuses of the system made by those in charge of certain convict squads, but this is exceptional, and wherever it has come to the notice of the people they have demanded a full investigation and the punishment of the perpetrator of the abuse.

These two latter forms of State aid, it seems to me, will very shortly be in general use throughout the Southern States.

As stated above, I don't believe that many of the Southern States will appropriate any very large amounts for public road construction, and, therefore, the necessary funds for this work must be provided principally by the counties and townships. The question then arises, How can the necessary funds be obtained? There are four sources of providing funds for this purpose:

1. By a direct tax on the $100 worth of property.
2. By bond issue.
3. By poll tax for road construction.
4. Special tax on vehicles of all kinds using the roads.

It may be worth while to discuss briefly these four methods of raising revenue for good-roads construction.

1. Many are in favor of the tax on the $100 worth of property as a means of raising revenue for the construction of good roads in a county. To my mind, however, this is impracticable except in those counties which contain large cities where there is a consolidation of wealth. In counties of this character, if the revenue raised by taxation on the city property can be used for good-roads construction in the county, sufficient revenue can be raised to carry on the good-roads work, and without a high tax. If, on the other hand, the county does not contain the large cities, but has to depend entirely on the rural sections for all its revenue for good-roads construction, it is impossible to obtain sufficient revenue without levying a very high tax, i. e., 75 cents to $1.50 on the $100. In some of the Southern States, as Virginia, city property is not taxed for good-roads construction in the county, while in North Carolina the cities pay a tax for good-roads construction in the county in which the city is located.

2. I am more in favor of a county issuing bonds for good-roads construction than of a high tax, for the reason that the issuing of bonds makes available funds in sufficient quantity to render possible the construction of a certain definite number of miles of road within a definite time.

They give us the benefit of good roads almost immediately, while payment for them is deferred for many years until the county has progressed in material wealth sufficiently to enable it to pay the bonds without unnecessary inconvenience.

They obviate the necessity for a high road tax, and yet give us the same, if not better, results than would be accomplished with such tax.

While a number of counties in the different Southern States have built their roads by revenue raised by direct tax, it will be found, upon investigation, that these counties contain in nearly every case cities of considerable size, which represented a consolidation of wealth that could be taxed for good-roads construction in the county at large.

I believe that most of the counties are now beginning to realize that bond issues for good-roads construction is the most advantageous, and evidence of this is seen in the large number of counties throughout the South that are issuing bonds for this purpose.

3. Another means of raising revenue that I firmly believe in is a poll tax of from $1 up for good-roads construction, this to be levied whether the general revenue is raised by direct taxation or by bond issue. My reason for this is that every man, whether or not he owns any stock that will travel on the road, or whether he owns any property, is directly benefited by the construction of good roads in the community in which he lives by the uplifted tone of the community, the general increase in values, which has never failed to follow in the wake of public road improvement, in the increase of trade and the demand for labor in both country and town.

4. A tax on all vehicles using the public road, which shall be in lieu of any other, seems to me a right and just tax.

This tax should be graduated according to the character of the vehicle, the load it is supposed to carry and the width of the iron tire; thus, carriages and buggies with rubber tires would be taxed the lowest amount, as they would do the least damage to the public road. The same vehicles with narrow iron tires would be taxed slightly more; wagons with broad tires would be taxed a little in excess of the narrow-tired buggies and carriages, while the narrow-tired wagons would pay a considerable more tax. The

automobiles would pay a tax according to their horse-power and size. If this tax were in lieu of any other property tax on vehicles, and the revenue raised should all be used in the maintenance of the public road, I do not believe there would be any serious objection to such a tax being levied. One-half of this tax should go into a general State fund for maintenance of public roads, to be expended under the supervision of the State highway engineer, and the balance to go to the counties in which the owners of the vehicles reside to be used in the maintenance of that county's roads. This method of taxation, it seems to me, should become very generally adopted by the Southern States, and if rigidly and impartially enforced, would raise considerable revenue for the maintenance of public roads, and at the same time would work no hardship whatever on any individual.

Another question that confronts the road engineer in the Southern States is what surfacing material to use. I believe that to advocate indiscriminately macadam or tarmacadam roads as the only improved road for the South would discourage and effectually set back the cause of good roads in many sections. In certain sections of the South it has been found to be absolutely impracticable to build the public roads of macadam, but considerable material has been found for building satisfactory sand-clay and gravel roads.

The question of the distribution of materials which are suitable for road construction is a matter that needs investigation in every Southern State. A large part of the South, especially in the Coastal Plain and Piedmont regions, appears on cursory examination to be essentially destitute of materials which could be used in building roads, yet, when an engineer investigates this same region there are often located deposits of gravel, or rock, or clays and sand for surfacing roads, and in the end it is found that a good surfaced road can be constructed within the means of the inhabitants where they had always thought it was impossible.

Of the accompanying cuts, 1, 2 and 3 illustrate the three types of improved road that are being built in the South. Fig. 1 is a macadam road in Durham county, North Carolina. Fig. 2 is a sand-clay road in Craven county, North Carolina. Fig. 3 is a gravel road in Richmond county, Georgia. Fig. 5 is a photograph of the type of road we are trying to eliminate in the South.

Another side of public road construction that is beginning to be squarely met by the different Southern States is the construction of culverts and bridges over streams and rivers. Where formerly it was the custom to ford the small streams and allow the rainwater to cross the road at certain intervals, culverts are now being constructed, as illustrated in Fig. 5. Iron bridges with concrete piers are replacing the old wooden bridges. In connection with this side of the public road work the experience of an engineer is again of very great value, and by having a bridge engineer connected with the highway division of the different States the counties can often be saved considerable sums of money in purchasing and constructing their bridges.

The past year has seen considerable advance made in the sentiment for good roads throughout the South, which has been expressed by the increased number of counties voting bonds or special tax for road construction. The counties are also realizing more than ever before the need of road engineers to take charge of their road construction, and there is a constant demand for such men in the different Southern States. This demand will increase not only with the increased amount of road to be constructed, but also with the still further realization of the counties that the employment of a competent road engineer to supervise the construction of their roads is actually money saved to the county. The counties are also realizing that public roads are permanent improvements, are a benefit to the whole county, and should, therefore, be constructed in the very best manner possible regarding grade, width of road and surfacing material.

Another feature of public road construction that is being emphasized, and one which is almost of as much importance as the construction of the road itself, is the maintenance of the road. Formerly many counties have failed to provide the necessary revenue to maintain improved roads after they were once constructed, and consequently many miles of macadam road have become disintegrated and will have to be entirely rebuilt. The other counties are profiting from this experience, and now in planning out their road work they are providing sufficient revenue to maintain the roads.

Movement of Homeseekers to the Southeast.

By M. V. RICHARDS, Land and Industrial Department, Southern Railway.

[Written for the Manufacturers' Record.]

Looking back over the 15 years since the land and industrial department of the Southern Railway was established, the work of interesting people from other sections in the South, the efforts to induce farmers and other settlers to make their home in the Southeastern States reached by our lines, I am of the opinion that not at any previous time in all that period has the outlook for the settlement of a good class of people on the farm lands of this section been so good as they are at present. It was hard work at first to interest people in this territory. It was naturally to be expected that it would be so. There were many reasons why farmers and others in the North who were seeking new homes, where they could secure cheaper lands and undeveloped opportunities, turned their attention to other portions of the country. For one thing, the movement had always been to the West. That was looked upon as the one section of undeveloped lands. There were virgin regions of vast extent out there. The people of the newer States were active in advertising their various communities. The great railroads leading to the West, most of them originally land-grant roads, and still possessing large tracts of lands which they could offer at low prices, had for years their land and immigration agents in all the fields of the country. That was, too, the region where free Government homesteads were to be found, and as Indian reservation after reservation was thrown open to settlement, causing new exoduses from the older States, the rush continued. It was not only from the Northern and Middle States, but from the Southeast as well.

People desiring new homes thought only of new sections. Many of them preferred unsettled communities, for there they could make their own conditions, their own settlements, and found their schools and municipalities upon their own ideas—those they carried with them from their old homes. The South, and especially the Southeast, was looked upon as an old settled section, and regarded as developed. Few believed there were any great amount of desirable lands which could be had at attractive prices. The Government and other reports showed small yields per acre of most crops in the Southeast, and the impression became general that the lands were either worn out or naturally unproductive. Another thing was against the South. The Northern farmer and the thrifty European who helped so much in the building up of the Northwest wanted to locate in a community where the school facilities were good. The public school system of the South was comparatively new; it was far behind that of the Northern States, and settlers preferred to go to a place where they could create their own school system and could make it what they wished.

It was a work of education to create an interest in Southern lands and Southern opportunities. The forces which have been at work for the past 20 years or so have steadily advanced, not only in making the South more attractive to the homeseeker, but in convincing him that in the Southeast there were many opportunities; that the lands were not only cheap, but productive; that the conditions of life were as represented; that the various States had taken up the school question, and in all of them fine systems, well supported, were established, and that any line of agriculture could be carried to advantage.

From year to year there has been a larger movement from the Central and other Northern States to the Southeast. At first it was the individual farmer; later small colonies from the same communities found their way into the Southeastern States; today there is a steady and growing disposition to locate on Southern lands, both improved farms and undeveloped tracts. The National Department of Agriculture and the States have given so much attention to Southern farm problems, the agricultural schools and experiment stations have done so much to educate farmers and to make known the possibilities of the various types of soil, that now there is a wide understanding of the opportunities to be found throughout the Southeast. Another thing which is aiding the movement is the fact that dealers in lands have taken up the Southeast and are advertising its advantages and opportunities as they have in the past the newer West, and there is more of a disposition on the part of landowners to divide their large tracts and sell them in quantities suited to the requirements and abilities of the settler.

A few instances will show the movement into the Southeast today. In the prairie belt of East Mississippi alfalfa culture was begun six or seven years ago. It was the work of a native of the community. His success, which was phenomenal, induced others to go into the raising of this great hay and forage crop. Northern farmers in their investigations looked over that section, saw what could be done with this crop, compared the value of the lands with those of equally productive lands in other portions of the country, and soon there came many well-to-do farmers from the richest portions of the North Mississippi Valley. They are being followed by others, and throughout all that section can be found families from Illinois, Indiana, Iowa and other States, and they are advertising the advantages of all Mississippi and of the black belt of Alabama. In Southern Alabama, near the Gulf coast, the cut-over pine lands were turned into gardens and truck farms. Men from the North, including many originally from Germany, Norway and Sweden, were induced to buy small tracts and plant vegetables and set out orchards. The fine returns and the increasing knowledge of the value of these lands started a movement in that direction. Within the past few months sales have been made to a colony of thrifty people from Pittsburg, which will take up several thousand acres, while in the same district another large tract has been sold to well-known men from the West, who will not only carry on large developments on their own account, but will settle 100 or 200 families on their lands. Down in South Georgia and Northern Florida, in our territory, to the cut-over lands, lands which are extremely valuable for special and for general farm crops, Northern people are moving in steadily, both in the settlement of colony lands and on individual account.

Within the last year there has been two movements on our lines which deserve special mention, as they show what the active, progressive men of the South are doing to make conditions favorable for the man who wishes to live on his farm and to cultivate it himself. Large plantations, plantations well improved and which have been profitable, have been bought and divided into small farms, of varying size to suit the purchasing ability of settlers, and are being sold to them on long time. This tendency is doing much for the Southeast, and is of itself evidence of the movement into the section of the homeseeker.

Many delegates from the West to the Farmers' National Congress at Raleigh in November made their journey there by way of East Tennessee, Western and Piedmont North Carolina. A good portion of them took occasion to look into conditions they found there, with the result that since that meeting we have had many letters from them telling of their desire to secure homes in those regions. The investigations made by delegates in Southern Virginia and in the country around Raleigh have interested them in those districts. In Virginia there is a steady settlement of people from Ohio, Pennsylvania and other States, and this State is also getting a goodly number all the time direct from Europe. The country from Huntsville to Sheffield, Ala., and from Chattanooga to Morristown, Tenn., has received in the past six years hundreds of farmers from the Middle States, and more families are coming every month. In Piedmont South Carolina, in the central portion of the State and in the Charleston district many people from the outside have located the past year. This is also true of both Northeast and Northwest Georgia, of Central Alabama and the Western Tennessee country. The diversification of crops, the splendid returns from Southern farm lands when properly cultivated, the better understanding of real conditions in the South and of its climate and of the better local markets afforded by the growth of the manufacturing districts, as well as the steadily improving facilities for sending produce to the North, are attracting settlers to the low-priced lands. It is impossible to do more than estimate the number of new settlers in the Southeast located in the last year, but the number is way up in the thousands. Not long ago there left Cincinnati for the Southeast on one train something like 150 bona fide land purchasers.

With the right kind of co-operation among all forces interested in the development of the Southeastern States the present movement will be made still greater. We can show homeseekers that our territory has the most positive advantages; that our lands are the cheapest good lands on the American continent now available for settlement or purchase by people who desire to live in a good section. The men already in the South from the North are doing a great advertising work, and their friends are joining them. This is a movement which is scattered, naturally, and which is hard to recognize; one that comes without any flourish of trumpets, which rarely gets into the newspapers; but it is steady, it is large, it is growing all the time. It is this movement which the most intelligent forces at work for the Southeast have endeavored to foster, and which will do most to advance the real interests of the South.

Washington, D. C.

RAILROADS AND THEIR CHANGING RELATION TO THE PUBLIC AND TO EACH OTHER.

By Charles Catlett.

[Written for the Manufacturers' Record.]

It is of service to note the change which has taken place in the attitude of the railroads toward the public and toward each other within the last few years, and much encouragement may be derived from such consideration.

In the inception of railroad development it was realized that the transportation lines were essentially of public interest, and hardly any railroad was inaugurated without State or Federal aid. This resulted in much "log-rolling," and many things were done in the way of location which seem queer in the light of recent development.

The next stage of the railroads was when the "controlling interest" ceased to recognize the obligations implied by State aid or minority stockholders, and the roads were treated as if they were the individual property of the management, and were exploited for the benefit of a few individuals or of special communities. The plea of necessity seemed a sufficient excuse for doing almost anything, and such action was so common as to excite no comment except when exercised in some very flagrant degree. As a result of this period many usages, indefensible per se, have become a part of our body politic, and cannot be overturned without disproportionate damages; but with reference to the future, it is very certain that no such policy will be followed. Conditions have again reached the stage where it is recognized that the public, as well as the management and the stockholders, is an interested party in every transportation company and in every transportation problem, and that the best interests of all and the greatest ultimate profit to the stockholders of the transporation company must come from treating all exactly alike, from following development along reasonable and natural lines (not artificial and peculiar lines) and from making a special effort to build up the latest resources on the line of each particular transportation company as distinguished from an effort to build up a distant section with a view to furnishing through traffic.

This was brought to my attention very forcibly in a trip made recently over the Carolina, Clinchfield & Ohio Railway in company with some of the officials of that road and with others who were interested in it. This road, which was described at some length in the Manufacturers' Record recently, is a magnificent new line which will ultimately connect the great Northwest with Charleston, S. C., and will lend its part toward restoring that city to its ancient prestige as a great maritime center of distribution. This road, when it is complete, will offer one of the best and most beautiful, as it will be one of the most direct, lines between the coast and the interior. At present it is in operation between the coal fields of Southwest Virginia and Spartanburg, S. C., and offers a wonderful gateway across the Blue Ridge, which in its final alignment will have a minimum grade in each direction.

In particular was I interested to hear the talk of Mr. Conrad Miller of Nazareth, Pa., a veteran railroad builder and manager. Mr. Miller, who is in his seventy-second year, is as active as many a man 20 years his junior, and his mind, which has all of the vigor of well-rounded maturity, has at the same time the alertness and the aggressiveness of youth. Mr. Miller's outlook is mainly forward, only incidentally backward, and such men never grow old. He has always been an enthusiastic believer in Southern development, and it was interesting to hear what he had to say in regard to what the railroads must do to meet the conditions which confront them.

Commenting upon the wonderfully complete line of the Clinchfield—"the best new line he had ever seen"—he said: "The Southern roads cannot stand still. If they do, they will be overwhelmed. They must be rebuilt, so as to handle with certainty and dispatch the enormous amount of freight which will come to them. A badly-built road is a continual tax on the community which it serves, and a source of little profit to its stockholders." Mr. Miller did not look for a reduction in rates. The rates are already cheaper in this country than they are anywhere else in the world, and he thought that cheapness was secondary to regularity and dispatch of business. The transportation companies usually break down when business needs them most. The only way that this can be avoided is to improve and in many cases rebuild the Southern lines. This would require vast sums of money, and an assured return must be gotten for these additional investments before an adequate return would be received by the stockholders of the road. But the immediate effect of such rebuilding would be to enormously enrich the section by furnishing it the facilities which will be necessary to carry on its business. He said that this money would surely be forthcoming, provided the roads were amply protected against inimical legislation.

And then, Mr. Miller said: "A road must do more. Take this line; it is essentially a 'cheap power line.' There are many points on it where power can be produced from coal as cheaply as from water falls which are advertised to furnish cheap power. Not only should the road welcome those who come to it, but should go after them, give them the benefit of its organization of trained men, work out for them the opportunities in the way of natural resources, guarantee them cheap power, and, if necessary, help them to finance conservative propositions." It is only by such methods, Mr. Miller continued, that development can be accomplished in a short time, and as great as will be the natural growth of a favored section, it will be far more rapid if the railroad organization is not content to place a limit on its activity by simply building a road, but must also make equal effort to build and develop its local traffic. This must be done on sound economic lines, and not, as formerly, by ignoring local conditions for some through line advantages.

From thoughts which were gathered at that time, I venture to say that another important modification of policy is imminent. There will be an increasing interchange of facilities, which will guard the country and the railroads from the enormous waste which comes from forcing traffic along "long hauls" and in unnatural directions. The road which makes a reasonable traffic arrangement or trackage arrangement with another gains more than if it compels a coworker in its own protection to extend a new line and give two roads inadequately served instead of one line with dense traffic and high-grade service. If a good road exists which is big enough to fight its own way and possesses within itself the possibility of producing large tonnage, the thing for all other roads to do is to make such terms for handling its product that it can never want anything better, and then to foster it in every way as if it were a branch line. We are at the threshold of an interchange of trackage rights and facilities which will mean an increased saving to the community and its railroads, and which, indeed, will be necessary to enable the railroads of the South to quickly put themselves in a position to handle the business which will come to them in a manner which the people of that section have a right to expect.

A road which is in a position to use the tracks of another line more economically than its own is in a position, as it were, to immediately increase its facilities and its ability to handle a larger volume of business and to give better and prompter service to its shippers without the expenditure of large sums of money. To fail to do so is but breathing a remnant of the spirit of the past, and would be like a man who insisted upon running his automobile over a crude, unfinished country road at high expense rather than over a magnificent pike, because on the latter some one else gets an insignificant toll.

SETTLING UP THE SOUTH.

By J. F. Merry, General Immigration Agent Illinois Central and Yazoo & Mississippi Valley Railroad Companies.

[Written for the Manufacturers' Record.]

Settling up the millions of acres of cultivable lands in the South with families who have had experience in agriculture and who will become desirable citizens is not so easy a matter as some suppose. The Illinois Central Railroad Co. has for 25 consecutive years given special attention to advertising the agricultural possibilities of Tennessee, Mississippi and Louisiana. For the past five years from 1,000,000 to 1,500,000 of pamphlets, leaflets and circulars describing in detail the character of the soil and the great variety of farm products successfully and profitably grown in that territory have been distributed. In addition to such advertising, this company has for years collected annually a great variety of farm products grown in Tennessee, Mississippi and Louisiana, which have been exhibited at State fairs, land congresses, corn expositions and horticultural gatherings throughout the Northern and Western States. It has also run through Central Illinois and Northern Iowa during the past two years a special train, consisting of an exhibit car and a lecture coach, which made stops at the small towns and to which the general public, and particularly farmers, were cordially invited. The exhibit car contained over 200 varieties of farm products, all of which were grown in the Southern States mentioned. The lecture coach at 2 P. M. was usually filled with farmers who had carefully looked over the exhibits and had become interested to hear what the writer had to say concerning the agricultural resources and possibilities of the Southern States in which the Illinois Central Railroad Co. was especially interested.

And yet, with all this exploitation and advertising of a section of the South admittedly among its very best, we have not been able to convince great numbers of Northwestern people of the real advantages which the South possesses, especially to homeseekers with limited means and a thorough, practical farm experience. During these 25 years, at a conservative estimate, 25,000 Northern people (which, reduced to families, would mean about 5000) have as a direct result of the efforts of the Illinois Central Railroad Co. been permanently located in Tennessee, Mississippi and Louisiana. The three Southern States mentioned have 231 counties and parishes. Had the 5000 families referred to been equally distributed among the counties and parishes of those three States, less than one family per county per year would have been the net results of all the expenditures and the persistent advertising of the Illinois Central Railroad Co. for a quarter of a century.

We would not be understood, however, as putting up any tale of woe that our efforts have not been more successful as to the number of families actually located, for there is a feature of this work, and of which we are proud, which compensates in a measure for any disappointment which we may have had in not securing a larger number of settlers. I refer to the fact that among the 25,000 Northern people who have been located adjacent to the Illinois Central Railroad in Tennessee, Mississippi and Louisiana not a single letter of complaint has been received that they were not heartily welcomed to their new home in the Southland or that they had not been cordially received by their Southern neighbors. This speaks volumes, not only for our Southern friends, but it indicates very clearly that the 25,000 settlers were a high class of citizens who located in the South with a view to making it their permanent home and to co-operate with the people of their respective adopted States in making it educationally, religiously, agriculturally, industrially and commercially the equal of the Northern State from which they emigrated.

The South needs today a million of such citizens to develop the more than 200,000,000 acres of farm lands and to operate an unlimited number of industries in manufacturing the raw material, of which there is such an abundance in that territory. The question is, Are they to be found, and how can they be secured? To my mind the Manufacturers' Record, by its weekly publication of the South's advantages, is contributing more than any single agency in disseminating information that will convince our Northern friends of the marvelous opportunities in the South. If we may judge from the correspondence that daily reaches this office, never has there been a time when so many people were studying the South's conditions with a view to making investments, and I am sure that in this territory never were so many people planning to locate in the South as now.

The development of the alluvial overflow lands of Louisiana, now recognized as entirely feasible, means much for that great State. The organization of drainage districts throughout the Yazoo-Mississippi Valley, which William E. Curtis declared was "the richest valley in this hemisphere," will soon make it a veritable five-million-acre garden. The boys' corn clubs of Mississippi, which cover nearly half the counties of the State, with a showing of from 70 to 148 bushels per acre, and which were largely responsible for an increase of over $5,000,000 in the value of corn production in Mississippi last year, have already placed the State in the list of corn as well as cotton States. The fruit and vegetable industry along the main line of the Illinois Central, extending from Kenner, La., to the Kentucky line, has reached such a magnitude that single stations that only a few years since were ambitious to grow a few crates for Northern markets now ship by trainloads. In Madison county, Mississippi, where so many Northern families are now located and are engaged in diversified farming, four J. I. Case threshing machines are found necessary to thresh the rustproof oats that are so successfully grown in that county.

The new conditions above referred to indicate the possibilities and growth of that

particular portion of the South, and give promise that henceforth all honest advertising of the South will have its sure reward, and that the development and settlement of all the cotton States will be more rapid in the future than it has been in the past.

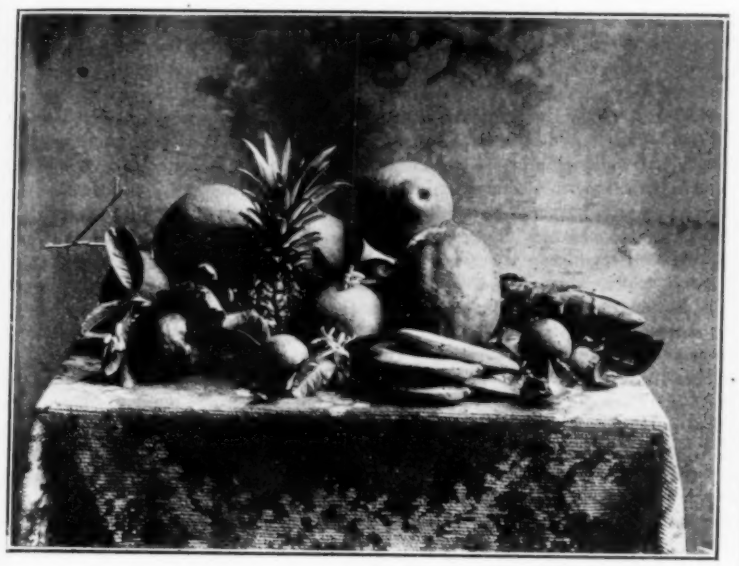
Manchester, Iowa.

CITRUS FRUIT INDUSTRY OF FLORIDA.

By J. H. Reese.

[Written for the Manufacturers' Record.]

It has required 15 years for the citrus-fruit industry in Florida to rehabilitate itself. The crop which was destroyed by the great freeze of 1894 was estimated at



FRUITS GROWN IN DADE COUNTY IN THE FLORIDA EVERGLADES COUNTRY.

6,000,000 boxes, and never since that time until the present season has the estimate run into such figures. Six million boxes is the estimate for the crop that is now being marketed.

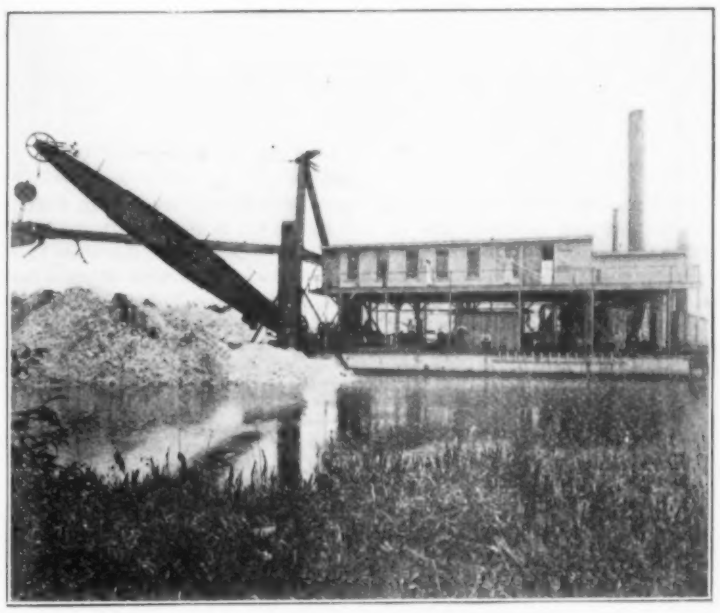
It was no accident, yet it may be regarded as a fact worthy of note and interest and something of a coincidence that the year which signalized the recovery of the industry to the mark it had reached 15 years ago should also mark a radical change in the manner of handling the crop. These two things regarded together forecast, if they do not absolutely guarantee, a better future for the business and individual prosperity for the growers.

The past 15 years of struggle through difficulties of different degree have brought the growers together with much unanimity in the organization of the Florida Citrus Exchange, and they are expecting much of benefit from it. This organization was

FARM ON RECLAIMED EVERGLADES LAND.

patterned after the California Fruit Exchange, and was the result of careful study of the California system by a large committee of practical growers and transportation men. The party went to California and in person learned the details of the system, and upon their return they drafted some of the leaders from California and engaged their services in organizing the growers of Florida. The work done by these commercial evangelists has been instrumental in bringing about two-thirds of the crop to pledge for handling by the exchange, and this is accounted great success for the first year. It is believed that one or two seasons only will be necessary to demonstrate the success of the plan so emphatically that practically all growers will eventually become members. The exchange directs its energies to the packing, shipping and marketing of the fruit, securing uniform pack and grade and proper distribution, which latter means wider distribution and better prices.

The plan has worked well in California, and its advocates believe it will do as much for the growers of Florida. While the exchange was adopted primarily by the growers of citrus fruits, the pineapple growers have also been solicited to take advantage of the system, and about the same percentage of the pineapple growers have joined, and better market conditions as an outcome of this co-operation seem probable. The central exchange is located at Tampa and the subexchanges are directed from this central office. Packing-houses with the latest machinery for handling and packing fruit have been constructed over the State, and the fruit handled in this manner, and for the first time in the history of Florida, is being handled without being touched by the naked hand. The exchange system is thus considered not only the means of



VIEW OF DREDGE AT WORK NEAR MIAMI.

betterment for the growers, but for the consumers as well, and incidentally for all concerned. At this time the future of the industry is promising, and if the exchange system is managed as successfully as it seems reasonable to suppose that it will be there appears little ground to apprehend that the business of growing citrus fruits for commercial purposes will be overdone, even if it should double itself in the course of the next 10 years. The probability is, in fact, that it will much more than double itself, for the ratio of increase is greater now than ever before and the number of newcomers to Florida was never so great. It is impossible, of course, to make any estimates as to the possibilities of expansion, but it is likely that many who are buying lands in Florida will plant groves, and the next 10 years will undoubtedly show a great increase of production. It may be regarded as fortunate, then, in view of this prospect, that the Citrus Exchange was established thus early, for if some plan were not

VIEW OF EVERGLADES DRAINAGE CANAL.

offered for the systematic marketing of the crop the business would offer no alluring reward to the prospector, and it would be a question of scant living to those already engaged in it.

The assertion often made that Florida is the home of citrus fruits loses none of its truth by much repetition. This is demonstrated by the reports of the Commissioner of Agriculture. There are 47 counties in the State, though most of the maps show only 46. The last Legislature created the new county of Palm Beach from a part of Dade. Of the total number of counties in the State there are 34 in which oranges are grown. Many of these are located above the so-called frost line, and indicates that the weather for years may not be severe enough, even in the northern portions of the State, to kill the bud; but the prospective grower would be careful not to locate his grove in those sections where he would assume such a risk. The north-

west blizzard which swept over the country in December of 1894 cost the growers of Florida $50,000,000. Those counties which are likely to offer security from the jeopardy of freezing weather might be aptly designated by scanning the reports that were issued the year following the great blizzard, though even this would be no positive guide. The year before the freeze there were 33 counties to report orange crops. The year following the disaster there were only 15 to report living trees. These were Alachua, Brevard, Citrus, Clay, Dade, De Soto, Hernando, Hillsborough, Lake, Lee, Marion, Orange, Pasco, Polk and Walton. The trend of the industry, however, may be better gained as to general adaptability and suitable conditions by recounting the counties that lead in production of oranges at the present time. The figures for the crop of 1907-08 are here used. Only those producing more than 100,000 boxes given:

Counties.	Boxes.
Brevard	234,698
De Soto	559,053
Hillsborough	720,290
Lake	228,171
Manatee	234,833
Marion	130,937
Orange	686,400
Osceola	150,346
Polk	170,452
Putnam	171,126
Volusia	290,744

The list enumerated does not include many counties that grow citrus fruits to perfection and with immunity from danger of cold, but is recited with the idea of showing the centers of orange growing. It should be borne in mind that these figures refer only to the orange crop, and do not deal with the many varieties of citrus fruits that grow abundantly in Florida. That list is a lengthy one, including grape fruit,

DREDGING A CANAL IN THE EVERGLADES.

tangerines, lemons, limes, kumquats, citrons and their innumerable families. In numerous counties not mentioned the citrus-fruit industry is yet young and the production comparatively small, and these in the course of time may yet lead some of the counties that now head the list. In Hernando county, for example, the land and the conditions are ideal for the production of citrus fruits, but for one reason and another, in which adaptability does not figure, some of the best lands in the State have not been turned to account. One of the chief of these has been the lack of transportation lines, but this is a difficulty which is being overcome by degrees, for Florida is yet a virgin State, and when the producing population becomes greater and more capital is invested in railroad and steamer lines these fertile sections will be giving their full quota to the markets.

The grape-fruit industry is just beginning to be developed, the total crop for the season of 1907-08 being only 469,722 crates. Brevard, Dade, De Soto, Hillsborough, Lake, Lee, Manatee, Marion, Orange, Osceola, Polk and Volusia are the pioneer counties. This crop is one of the most profitable after the trees come into bearing. It is to be expected that there will be great activity in the growing of grape fruit in the next few years because of the seemingly better opportunities offered for profits on investment and labor. It has been but a few years since the grape fruit had no market value. Even now it has none in Cuba, and the native growers depend entirely on export sales for returns.

But in this country the market has been established, and the grower who puts out good fruit need have no fear of not realizing fair reward for his labor and investment. It requires some years of careful attention, however, to plant an orchard and bring it into bearing, and the question that the investor would have to consider would be that of maintenance while he waits for his investment to bloom into a money-maker instead of an expense.

High pine land or hammock land, which may be found without trouble in Florida, is recommended by experienced growers as the best for grape fruit, but there seems to be no ironclad rule as to the selection of land. Some of the best groves in Dade county are on muck soil, located on the edge of the Everglades. As to whether the muck land of the Everglades, which are now being reclaimed by the State, will be good for the growing of citrus fruits is a question yet to be determined, but in view of the success of the growers who have settled on the land adjacent to the 'Glades it would appear reasonable to judge that the 'Glade land will be equally good. At any rate, the would-be investor would have his choice of soils from the examples of bearing groves that may be seen in a tour on the east or west coasts and through the interior of the State. The price of land ranges from $15 an acre to $100 an acre, owing largely to location with regard to avenues of transportation. The original cost of clearing the pine lands or hammock lands is conservatively placed at $75 an acre. The trees are planted 25 feet apart, 70 to the acre, and the cost of the plants is 30 cents each. The cost of fertilizer is $35 a ton, and to begin with about eight pounds to the tree each year is applied. This amount is increased gradually from year to year as the trees grow, and the demands are greater until the amount to the tree reaches 15 or 18 pounds at the age of eight years, when, with proper attention, the grove should reach mature bearing. The cost of labor would depend much upon the amount of work the owner would do himself, but while the grove is growing this item might be placed at from $15 to $25 per acre. An experienced and successful grower who has a new grove under cultivation gives as his actual expense for fertilizer and labor for one year, being the fourth year, for 60 acres, as $2031.78. The grape fruit sometimes begins to bear in four years, and even at six or seven years it begins to pay, but it does not reach its mature production, as a rule, under eight years. This may seem a long time to wait, but if market conditions continue as they have been the investment is good, provided the owner has other means to make a living while he is waiting for his great expectations to materialize. It has not been unusual for growers to receive as much as $2.75 a crate for the crop on the trees, which means that the buyer takes all the expense of gathering, packing and shipping. The mature trees give an average yield of six boxes to the tree. The profits are easy to figure. A 10-acre grove is probably enough for one man to look after, with some help, and it is not unlikely that 10 acres have proved too much for some, but these figures are given from actual experience, and may be relied upon. The grower should be able to net $2 a box on grape fruit, with the expense of gathering and marketing paid for by the excess he receives above that price. There is much for the novice to learn, and one would hardly undertake the experiment without proper instruction and advice, but he may learn if he will, and when he gains by experience he is possessed of valuable knowledge. The opportunities for gathering information are much better than they were a few years ago. The subtropical laboratory and gardens are located at Miami, where experts have been working for years for the propagation and growing of all tropical fruits, and in addition to this the growers themselves are considerate of those who plant groves, and in the growing districts a newcomer would find nearly all of his neighbors competent authority. This, to say nothing of the advantages offered by the State and United States departments of agriculture and the Bureau of Plant Industry.

Many publications of value have been issued on the subject of citrus fruits, and for one intending to enter the industry it would be well to read some of them with care before he makes the decision. One of the best of these is the work issued by H. Harold Hume, former professor of horticulture and botany in the University of Florida and horticulturist and botanist of the Florida Experiment Station. The book is from the press of the Drew Company at Jacksonville. As to Florida soil for citrus fruits, Professor Hume says:

"The soils of Florida are commonly grouped according to elevation and the growth which they support or have supported in a virgin State. Those commonly used for citrus culture are high pine land, flat woods, high hammock and low hammock. On all of these citrus fruits have grown and are grown successfully."

Another authority on the cost of starting an orange grove makes the following estimate:

Five acres of land, per acre, $15	$75 00
Five acres clearing, per acre, $50	250 00
500 budded trees, each tree, 30 cents	150 00
Planting, per acre, $15	75 00
Labor, per acre, $20	100 00
Fertilizer, 1¼ tons	46 25
	$696 25

This is the expense he estimates for the first year; the second year he places at $174 for labor and fertilizer, and at the end of the seventh year the grove will have cost $2741.25. He estimates that the crop at the fourth year will be worth $100, being 50 boxes, at $2 a box; the fifth year there would be 100 boxes; 250 the sixth; 500 the seventh, and 1000 the eighth. Thus he shows that the total income in eight years would be $3800 against the cost of $2741.25, and that the grove at that age would have a value of $1000 an acre, which would show an investment value of $5000.

Such has been the experience of many growers, varying in degree as to the amounts expended for labor and stock and fertilizer. Carefully managed, the business is profitable, but alertness and good judgment are essential to success, and no small measure of patience is required. It is no bonanza, to be sure, and the new grower would encounter many discouragements, but so it is with all undertakings that promise valuable reward for the exercise of diligence and intelligence. The citrus fruit farmer has the advantage of other classes who till the soil. He has more time at his disposal, his busy season is brief, and the pursuit in which he is engaged is essentially one of scientific study and pleasing experiment.

Miami, Fla.

ROCK ISLAND-FRISCO DEVELOPMENT WORK.

By C. B. Schmidt, Commissioner of Immigration.

[Written for the Manufacturers' Record.]

Of the 17 States served by the lines of the Rock Island-Frisco Railway system in the West and Southwest, the following eight have during the past year absorbed nearly the entire volume of our homeseekers' and actual new settlers' business, namely, Arkansas, Colorado, Kansas, Louisiana, Missouri, New Mexico, Oklahoma and Texas. During the fiscal year ended with June, 1909, 44,564 initial inquiries for information

about those eight States have been received at our department of immigration, being an increase of over 30 per cent. as compared with the preceding year. A total of 48,502 persons have availed themselves of our "homeseekers' excursion" trains, which leave our gateways every first and third Tuesday of each month, and while this shows a slight decrease from the preceding fiscal year, the volume of actual new settlers who have taken up farm lands within the eight States named exceeded that of the preceding year by 112 per cent., 29,958 families having moved their household goods and chattels over our lines in carloads or part carloads and are now developing new farm homes. These new settlers have come chiefly from the Middle and Northern States of the Union, and they do not include the immigration which has moved into our country by the "prairie schooner routes," nor those who brought all their assets with them in their pocketbooks. These latter have generally helped to swell the population of our new cities and towns.

The figures given above do not include the direct European immigration which is beginning to be a factor in Southwestern land development. Heretofore only about 4 per cent. of the total foreign immigration to the United States had found its way direct into what we term our "homeseekers' territory," while during the fiscal year ended June, 1909, according to Federal statistics, we received a total of 39,297 foreign immigrants, of whom 6915 were farmers or farm laborers. This is equal to 5.03 per cent. of the total foreign immigration of 782,870 people admitted to the country during that period.

Considering the effort that is being made by the United States reclamation service, by railroad companies and private corporations to attract the attention of the homeseeker to the many irrigation projects and to the opening for settlement of large Indian reservations in the Northwest, our showing of Southwestern development by only one of several great railway systems serving the same territory is certainly not bad.

The business during the first six months of the current fiscal year, and for which exact figures are not yet available, promises to bring the results of the year well up to those of its predecessor. Agricultural conditions all over our territory are highly promising for a bountiful crop season in 1910. Western Kansas, Eastern Colorado, New Mexico, the Panhandle section of Texas and Western Oklahoma, being the sections where lands are yet within reach of the man with limited means, and where, in New Mexico, millions of acres of free Government land are yet available under the United States homestead laws, report heavy rains and snowfall, which have saturated the lands to an unusual depth. Two hundred and fifty million acres of unoccupied lands constitute the new settlers' opportunity in the Rock Island-Frisco States.

Agriculture is the greatest wealth producer and the foundation for the longest list of manufacturing industries, and this fact is nowhere more convincingly shown than in the aggregation of States comprising the Rock Island-Frisco territory, within which all lines of farming may be successfully followed and where the industrial development keeps pace with the agricultural.

Chicago.

Louisiana's Material Gains Through Rice Culture.

By W. W. DUSON of Crowley.

[Written for the Manufacturers' Record.]

The development of the rice industry in Southwest Louisiana and Texas has in less than 20 years added $200,000,000 to the material wealth of Louisiana and Texas; it has added 7000 families to their agricultural populations; it has built cities and towns where a quarter of a century ago there was only prairie grass; it has turned nearly three-quarters of a million acres of duck marsh into fertile farms; it has changed a scanty population of pastoral people, densely ignorant for the most part, into a large and thriving population of modern Americans; it has added to the food supply of the United States 24,000,000 bushels per annum of a valuable cereal; it has furnished a market for millions of dollars' worth of agricultural, irrigation and manufacturing machinery; it has filled waste places with schools, churches and comfortable homes.

A quarter of a century ago a few venturesome sportsmen knew the coastal lands of Southwest Louisiana and Southeast Texas as a likely hunting ground for wild ducks and geese. "The Louisiana marshes," as our prairies were called, were worth, when any value was placed on them, from "two bits," 25 cents, an acre to $1 or so an acre. The scanty Creole population subsisted by hunting and fishing and by raising herds of stunted Creole ponies and cattle. Small patches of corn were raised along the bayous, and here and there was a little patch of rice. Agriculture was of the most primitive kind. The little rice planted was sown in mud and herds of ponies were driven into the small enclosure to tramp it into the ground. Small coulees were dammed to retain water for irrigation. Little of the rice, or, indeed, of any crop, ever found its way to market.

Less than a quarter of a century ago a few Northern men began to drift in. Better farming methods were introduced, but for some years no progress was made in rice culture. Fruit culture was tried, but without success, for the reason that instead of devoting their energies to raising the natural fruits of the country, the fig and the orange, the settlers tried pears, which proved a failure. Then a freeze came and killed the oranges. Finally two Michigan farmers, the Abbott brothers, rigged up an old engine and hitched it to a primitive pump with which they pumped water from a bayou into a little canal from which they successfully irrigated their rice fields. And the canal irrigation system was born. In a few years modern pumps with enormous capacity, driven by great engines, had replaced the first Abbott pumps, and hundreds of miles of canals were furnishing a certain water supply to thousands of acres of rice. "Two-bit" land became five-dollar land, and then ten-dollar, twenty-dollar, thirty-dollar land. Settlers poured in from the neighboring States and from the North. Sixteen years ago the first country rice mills were built. In a few years the number of rice mills had grown from five or six in New Orleans to over 70. Small towns sprang up in Southwest Louisiana, to become cities in a few months. The rice territory, which at first was confined almost to Acadia parish, extended into neighboring parishes and then into Texas. The production of rice increased rapidly. In 1890 it was a few hundred thousand sacks. On December 15, 1909, the United States Department of Agriculture issued a report estimating the American production at over 6,000,000 sacks, about 24,000,000 bushels. The estimated acreage was 731,000 acres.

The history of American agricultural development shows no greater achievement in the reclaiming of apparently worthless lands than this. Here were lands that were popularly supposed to be worthless marsh. They were of such small account that the maps of 25 years ago represented them as a bare expanse, with even the streams scarcely traced. They were developed by no great engineers backed by large aggregations of capital. No highly-paid experts forecast their future and pointed out their possibilities. They gave no indication to the world of their extraordinary fertility, and no man dreamed that in them lay the germ of a great industry. Their development was the work of men unskilled in great enterprises.

The coastal plain, known as the rice belt, owes its development to irrigation—to a system of irrigation evolved by men who had never had the smallest experience in artificial irrigation. Paradoxical as it may seem, the future of this irrigated country depends on drainage. We solved the problem of getting water on the land. We are now confronted with the problem of getting it off. The rice belt has reached a stage, reached sooner or later by all one-crop countries, where crop diversity is necessary, and crop diversity cannot be practiced without adequate drainage.

While the rice industry has reached the point where production is fully up to the consumption, it is my opinion that the rice belt is approaching its greatest real prosperity. Just as we learned a few years ago that we could raise something here besides Creole ponies and cattle, we are now waking up to the fact that we can raise something besides rice. We are beginning to realize that by taking another step in development we can utilize our rich prairies for general crops, making rice our money crop and raising other crops to live on.

The next step for the coast country is drainage. A quarter of a century ago, when our prairie lands were worth not over a dollar or two an acre, the coastal marsh lands were almost absolutely worthless. Only recently we have found our mistake. Lands in Vermilion parish, in what is known as the Gueydan section, have in recent years been redeemed from the marsh by means of the simplest systems of drainage. Thousands of acres have been reclaimed and turned into good farming land by the simple process of digging drainage canals, which have carried off the water by gravity. Drainage is a simple matter in Acadia parish, 40 miles from the Gulf, and, of course, it grows more difficult as the coast is approached, but within a few miles of the coast it is still feasible to effect drainage by gravity. Below the point where this can be done, however, there are still thousands of acres of rich lands which can be drained at comparatively small cost by pumping the water off. The United States Department of Agriculture has recently been making investigations into the problem of draining marsh lands near the sea-level, and the verdict is that it is entirely feasible at a cost which makes it worth while to invest in these lands.

There are thousands of acres of land in Southwest Louisiana which in a few years will undergo as wonderful a change as the prairie lands underwent a few years ago. All this land will in time be available for rice lands, and with scientific drainage they will be suitable for diversified farming, with rice as the principal money crop.

It is interesting to note the value-producing capacity of these Louisiana and Texas rice lands, which less than a quarter of a century ago were so cheap. According to the United States Department of Agriculture the rice lands of Louisiana last year produced 33 bushels of rice per acre, worth 78 cents a bushel. The average production was worth $25.74 per acre. According to the same authority the average per acre of corn in Illinois was 31.6 bushels per acre, worth 57 cents per bushel, and the average value per acre was $18.01. In Iowa the figures were 31.7 bushels at 52 cents, worth $16.49 per acre; in Kansas 22 bushels per acre, at 55 cents an acre, averaging $12.10 per acre, and in Nebraska 27 bushels, worth 51 cents a bushel and averaging $13.77 an acre. The cost of raising an acre of rice in Louisiana does not exceed the cost of raising an acre of corn in Illinois, Iowa, Kansas or Nebraska. The average value of an acre of corn in Illinois is $18.01, as against the average value of an acre of rice in Louisiana of $25.74.

These are the figures of the United States Department of Agriculture for 1908. It is hardly necessary to comment on them at length. For the purpose of indicating what the development of the rice industry has done for Southwest Louisiana and Texas, I might ask this question in closing:

"If Illinois corn land producing a crop with an average value of $18.01 per acre is worth around $150 an acre to the investor of capital, what is rice land worth per acre which produces an average crop worth $25.74 per acre?"

Nothing I can say would add more to the answer to the question "What has the development of the rice industry done for Southwest Louisiana and Texas" than would the answer to this question.

SOCIAL EFFECTS OF THE COTTON INDUSTRY.

By JOHN WOOD, Secretary Board of Trade, Greenville, S. C.

[Written for the Manufacturers' Record.]

Cotton, the methods of its production, its marketing, its value as a commodity, its purchase and manufacture by the mills of the South, and the part it plays in the economic problems of the world, is a familiar subject of discussion. Also, it is well known to what an extent it has influenced the creation of new wealth, the induction of capital and the bearing it has had upon the progress upward of the South. What it has done for the agriculturist, for the manufacturer and for the commercial interests of the world are equally as well known and may be found tabulated in figures approximately, if not quite, correct, but its effect upon the social condition of the people as a whole, and particularly upon the condition of that class upon which depends the degree of quality, and, per se, the value of the finished product, has, despite the crusades of sociologists and numberless mysteriously commissioned emissaries, thus far failed utterly of proper, fair and adequate presentation. It is, indeed, peculiar that with all its knowledge of the cotton crop from the time of its planting to the date of its appearance as an article of wear for all the peoples of the world, there should be such ignorance on the part of the world of what the cotton industry has accomplished for those who dwell upon the borders of the cotton fields or within the villages of the mills.

There is accurate knowledge of what the mills, for instance, manufacture, of the amount of their payrolls, of the number, age and sex of their operatives, of the dividends their stockholders receive, of the value of their stocks. But what of the people of the villages? Have they in their village life kept pace with the advancement in the mills themselves? What is today the condition of this heterogeneous mass of workmen and workwomen who but a short time ago came unskilled and largely unproductive from the outlying farms or from the cabins of the mountainside to enter upon community life,

to be confronted with problems of education of hand and mind, of religion and ideals of citizenship? What has been done for them? What are they doing for themselves? To what an extent have they taken advantage of such opportunities as have been offered them? Further, to what extent has the responsibility for these thousands of people, in the main untutored in every respect, been recognized and accepted by those who were instrumental in causing them to forsake their native State?

Dealing here with these phases of Southern advancement, those pertaining to the mills, let us, by the citation of a few examples, see if through the agency of the manufacturer there is not being wrought a metamorphosis, and, withal, at cost of time and labor and money cheerfully expended by the mills, that even the cities, the counties and the State and the philanthropies of their individual citizens have neither exceeded nor approached.

There are three mills in the Greenville section that stand out as examples of what is being done. They are selected not merely because of the much they have accomplished, but because also of their position in a territory fast assuming giant proportions as a manufacturing center, which perhaps places them rather far forward into the light of public observation and scrutiny. These are the mills of the Pelzer Manufacturing Co. at Pelzer, those of the Piedmont Manufacturing Co. at Piedmont, and the Monaghan Mills at Greenville.

A STREET IN MONAGHAN VILLAGE.

A TYPICAL YOUNG MEN'S CHRISTIAN ASSOCIATION BUILDING.

Let us first consider the education problem as it is being worked out in these villages as compared with what the State is doing.

Average length of school term in South Carolina, 1907, 96 days.

Average length of school term in the mills, 198 days.

These two averages should be borne in mind when considering the figures given below:

	Enrollment.	Average attendance.	Per cent.
Pelzer	550	318	57.8
Piedmont	501	269	53.7
Monaghan	227	189	83.2
South Carolina	144,668	103,304	71.4

The figures for the State are for white enrollment, 1906-1907. They are based on term of 96 days, while those for mills averages are for 198 days:

	Population.	Average school attendance.	Per cent.
Pelzer	4,500	318	7.1
Piedmont	3,000	269	9
Monaghan	2,000	189	9.4
South Carolina	582,400	103,304	17.7

The figures are again based on compilation of whites. Comment upon what the comparisons last noted would show had the schools of the State kept open for nine months instead of the four and one-half months when work on the farms was at is slackest period, is unnecessary.

Of the while population of the State in 1906-1907, but 24.8 per cent. was enrolled in the public schools. There were enrolled 12.2 per cent. of the population at Pelzer, 14.3 per cent. at Piedmont and 11.3 per cent. at Monaghan, the last named not including kindergarten.

Of the State school population (do not confound with general population), about 61.4 per cent. are enrolled, and about 43 per cent. of the school population attends. Of the number enrolled in the State, about 71 per cent. attends.

Of the children in the Pelzer village, 39 per cent. are enrolled; of this child population, 22.7 per cent. attend; of the number enrolled, 57.8 per cent. attend.

Of the children in the Piedmont village, 50 per cent. are enrolled; of this child population, about 27 per cent. attend; of the number enrolled, 53.7 per cent. attend.

Of the children in the Monaghan village, 45.4 per cent. are enrolled; of this population 37.8 per cent. attend; of the number enrolled, 832 per cent. attend.

Again note disparity in length of school term.

It is only fair to state, however, that the expense of the mill public schools, not including kindergartens, is partly borne by the public school fund. But at most the public funds available are insufficient to maintain the mill schools longer than the average term of 96 days. Occasionally they do not suffice for that. At Pelzer the cost of public school maintenance per year is, approximately, $5000, of which the millowners pay about two-thirds. At Monaghan the cost is divided about equally between the millowners and the public funds.

THIS IS THE "CHILD LABOR" THAT GOES TO SCHOOL NINE MONTHS OF THE YEAR. OBSERVE THE HEALTHY APPEARANCE OF THESE CHILDREN

The following table, showing enrollment and attendance outside the towns of Spartanburg, Greenville and Anderson counties, three of the leading counties of the Piedmont section, with the figures from the mill schools covering the same points, may be of interest:

	Enrolled.	Average attendance.	Per cent.
Spartanburg	7,665	6,200	81
Greenville	7,296	4,864	66
Anderson	6,285	3,296	52
Pelzer	550	318	58
Piedmont	501	269	54
Monaghan	227	189	83

Following are given also the same comparisons, using the school in the cities of Spartanburg, Greenville and Anderson:

	Enrolled.	Average attendance.	Per cent.
Spartanburg	3,065	2,443	79
Greenville	2,212	1,698	77
Anderson	2,992	1,884	63

The average attendance for the schools outside the towns is about the same as that in the mill villages, even though they are for but half the length of term, while that of the schools in cities is but slightly higher.

The cost of school equipment at Pelzer is $10,500; at Piedmont, $7500; at Monaghan, $2000; enrollment in the three villages, 1278. The value of equipment is $15.64 for each scholar enrolled.

The average number of scholars per teacher in the State is 36; at Pelzer, 21; at Piedmont, 38; at Monaghan, 31.

The foregoing figures do not include night schools or classes for training in cooking, sewing, handicraft, music, etc.

The three mills, Pelzer, Piedmont and Monaghan, have invested, in round figures,

about $40,000 in building and equipment for the use of such organizations as the Young Women's Christian Association, women's clubs, training schools, lecture courses and entertainments, and associations for men of various kinds. A comparison is here made between the cost of maintenance of these institutions in Piedmont and Monaghan with that of the Y. M. C. A. in Spartanburg and Anderson. There is no Y. M. C. A. in Greenville proper at this time:

Piedmont, village population, 3000; annual cost $2600.

Monaghan, village population, 2000; annual cost, $4500.

Spartanburg, village population, 30,000; annual cost, $4000.

Anderson, village population, 15,000; annual cost, $1800.

Amount expended per capita in the mill villages, $1.42.

Amount expended per capita in cities named, 77 cents.

It may be noted also that the entire amounts expended in the cities of Spartanburg and Anderson are for males, nothing being done for women and girls. Also, that but for small membership fees, ranging from the inconsequent sum of 25 cents to $1 per year, the entire cost of these institutions in the mills is borne by the millowners, while outside the mill villages the institutions are largely self-supporting.

The amount annually expended for the Y. W. C. A. at Piedmont alone, with its membership of 160, its domestic science teacher, general secretary, kindergarten teacher, library, reading-room and gymnasium, within a community of 3000 inhabitants, is equal to that expended for the Y. M. C. A. at Anderson, a city five times as great, and over one-third of that expended in Spartanburg, a city ten times as great.

The value of the equipment for Y. W. C. A. and the work among the men, termed the "first cousin" of the Y. M. C. A., at Piedmont and Monaghan, is $31,500, and amounts to $6.30 for each individual of the combined population of the two villages.

Two other mills at Greenville, the Mills mill and the Woodside mill, are now inaugurating the Young Men's Christian Association, each having employed a secretary to devote his entire time to that work.

It may be stated that the success of the Y. M. C. A. at Monaghan, where a college graduate secretary is employed, has largely contributed to the determination on the part of the city of Greenville, or, at least, has hastened the determination here to erect a building for similar purposes, a campaign for which, to cost not less than $50,000, will begin in January, 1910.

A MILL VILLAGE DISPENSARY AND CLINIC.

Among the mill institutions will be found for the women and girls schools for cooking, sewing, night schools, social clubs, gymnasium classes, lecture courses, music classes, classes in embroidery, basket and bead work, dressmaking, housekeeping, together with basket-ball teams, baths and always a library. For the men are gymnasiums, libraries, night schools, basket and base ball teams, athletic meets, baths, pool and billiard tables, tenpin alleys and other features, besides the training schools, in which cabinet-making and other useful pursuits are taught. Each of the villages here mentioned has its band. One publishes a live and exceedingly creditable newspaper.

Paid secretaries, instructors and trainers are constantly on duty. Bible study, church work and charitable organizations and guilds are encouraged and maintained. A medical dispensary is now becoming a fixed part of village equipment. At Monaghan a trained nurse lives in the village and has an office, operating-room and loan closet, etc., and spends her time helping those who are sick and mothers with their children.

In each village may be found churches. Piedmont has four. Pelzer boasts the home office of the State Sunday-school Association.

While figures are lacking, it may be said with certainty that the percentage of offenders brought to trial from the mill population is smaller than that from any other class.

The death rate at Pelzer for the year ended August 31, 1909, shows that out of a population of 4500, the largest mill village in the State, there were but 19 deaths, 12 of these being infants, or one death for every 237 persons making up the village population for one year. The death rate in the other mill communities named in this article is stated as being but little if any above that of Pelzer. The reputation for health thus earned is due to several things, all of more or less interest.

First. To care in selection of village sites, splendid drainage, a naturally healthy climate (showing few extremes), pure water and reasonable working hours.

Second. To constant endeavor on the part of mill managements to educate the people in hygienic principles, in the care of premises, production of vegetables and other articles of food for themselves, including the keeping of cows in carefully scrutinized condition, and the wearing of proper clothing, etc.

Such work as this, it is needless to say, is the last usually participated in by the people of most towns and villages, to say nothing of the difficulty encountered by laborers for better conditions in the larger cities. In the mills the consequence has been physical improvement instead of the deterioration usually following change from country or farm life and environment to that of the community and its enervating processes.

The average mill village has become today not merely a mass of houses jumbled together for the accommodation of so many operatives. It is assuming lines of beauty. The managements of the three mills, Pelzer, Piedmont and Monaghan, as instances, have inspired the people with love for trees and flowers and vines, for neatness and thrift. Prizes are offered for the prettiest yards, the best flowers, the most attractive premises.

The first annual fair at Monaghan, held this year, attracted wide attention. Its exhibits of poultry, vegetables, fancy work, hand-made articles of wood and cloth, preserves, pickles and cakes and breads, drawing and painting, were a revelation, in that they betokened not only desire for excellence in these things, but that time was available for indulgence in them.

And, in conclusion, it should be mentioned that out of the 700 names on the Monaghan payrolls, but 448 are those of persons occupying houses owned by the mill. Two hundred and fifty-two, or 36 per cent. own the homes in which they live.

It is probable that in no better manner could the sentiment of any of the mill managements be expressed or the real concern on their part for the individual welfare of their employes be more concisely stated than in the following message from the president of the Piedmont Company to the women and children of Piedmont:

"I sincerely wish every one of you to become members of the Young Women's Christian Association. I feel sure that you will obtain much practical benefit and pleasure if you will join and take an active interest in the work of the Association. The Piedmont Company has erected and equipped a building for the exclusive use of the Y. W. C. A., and pays the salaries of a secretary and domestic science teacher, heats and lights the building and does its part. This company does not wish to be behind in the welfare movement becoming so general in the whole country. Surely you will do your part and take advantage of the opportunities offered. Help your girls to fit themselves to become more intelligent and helpful daughters, wives and mothers. We live but one life, and that is brief, and it is incumbent upon all of us to do all the good we can in promoting the interests of the community where we live. In what better way can we do good than by encouraging the growth of an institution established for the purpose of uplifting the home life and teaching the women and girls how to care for their health and their mental and spiritual growth?"

A MILL VILLAGE DAIRY HERD.

The foregoing suggests two thoughts: First, that the work is begun with the women, the greatest of all influences. Second, that on October 14, 1909, when the message was written, the president of the Piedmont mill evidently did not consider himself addressing a lot of ignorant, improvident, down-trodden people. The sentiment expressed is such as only those of a high order could understand.

BASIC ELEMENTS IN TEXAS PROGRESS

By WILLIAM C. CLOYD of Rusk, Tex.

[Written for the Manufacturers' Record.]

An article showing the material growth of Texas along all lines of human industry for the past 12 months would necessarily occupy more space than has been allotted me for this article, but I shall hope to convey at least a correct idea of progress made in such lines as I may touch upon.

As all wealth of this country is based upon its agriculture, it may be permissible to first take up those conditions which relate to that most important industry, and see what progress Texas and Texans have made in that department.

The complete yearly reports of the department of agriculture for the State not being completed up to date, I can only embody in this article the reports up to July and the estimates for the remainder of the year. Recent report of the Department of Agriculture at Washington places our cotton crop at only 2,570,000 bales, or 1,337,585 short of the crop of 1908. This estimate will hardly be sustained by the final count, for though it is recognized that the Texas crop is cut considerably short by droughty conditions of this year, yet that estimated shortage is entirely too great. The best-informed men with whom I have come in contact estimate that the shortage will not

exceed 750,000 bales below the 1908 crop. When there is a full crop labor conditions prevent planters saving all their cotton, while this year both a comparatively short crop, favorable weather conditions, together with the stimulus of high price, have resulted in gathering practically every boll of the staple grown. But unquestionably this season's crop will bring as much or more money than did that of 1908. It is observed that farmers are in far better condition now in nearly every portion of the State than at the same date last year. As proof of this the large bank deposits, a very considerable portion of which comes from farmers, is evidence of their prosperous condition. According to the report of the Comptroller of the Currency for November 16 last, the national banks of Texas had resources of $199,751,858, with deposits of $110,879,939. Of the 187 State banks I have been unable to get the aggregate figures, but learn their deposits have increased $9,980,686. It is reasonably certain that more farm mortgages have been paid off in Texas this year than in any other year in the history of the State.

But cotton alone has not done this. The corn crop, estimated at 125,000,000 bushels, and other crops have been helpful along this line; 7,500,000 bushels of wheat, 13,000,000 of oats, 3,250,000 bushels of Irish potatoes, 2,500,000 pounds of tobacco, 1,000,000 tons of hay and several thousand cars of early vegetables grown here and shipped to States north of us have contributed materially to this prosperity. In addition to the vegetable crop there is also a considerable income from berry and citrus fruit. The latter is really becoming an important money crop of the Gulf coast country, and with the impetus that industry has acquired within the past two or three years it promises to rival the big orange crop of California. Oranges grown anywhere along the coast from Beaumont to Brownsville are said to excel the California-grown orange both in size and color, but especially in flavor. Acreage in this crop has probably been doubled this year, and promoters of the industry are exerting every possible effort to increase the area devoted to the crop. Unless some disaster overtakes the industry, it is destined to become an important crop of the coast section of the State.

Immigration to Texas during the past three or four years has been a record-breaker, but that of the present season has certainly surpassed that of all former years. Early in the year Governor Campbell estimated that 200,000 people came here annually from other States. This would mean, if continued for five years, a round million new citizens for the State. But then what of the other five years of the present decennial period? It is hardly probable that rate of increase will apply to more than three or four years of the present half of the decennial period, but it is also reasonable to suppose that 1,250,000 will be added to the population of the State for the 10 years ending 1910, thus making 4,250,000 at next census.

It may be interesting to notice the fact that the great majority of this great influx of people have been going to the more remote portions of the State; that is, to the Panhandle, the western and the southwestern parts. Through this immense tide of settlers those sections have become more and better known, and rapid development has been the result. This has been the result of the activity of land agents and speculators. Moneyed men from many of the larger cities have bought large tracts of cheap lands in those sections and subdivided it into small tracts and sold it to the settlers at nominal prices and on easy terms, thus giving the homeseekers the opportunity of acquiring homes more easily than would have been possible where they came from. Those new citizens have proved valuable additions to our population, and will advance the development of those localities very rapidly, and thus increase the taxable values of the State.

While on the question of taxable valuation I want to call attention to the fact that since 1900 our values have increased $1,348,786,000, or a little over 50 per cent. But fully 75 per cent. of this enormous increase has been within the last five years. Should the same ratio of increase continue for the next 10 years our wealth would exceed $6,500,000,000.

While the heavy tide of immigration has been toward the western portion of the State, the central and eastern sections have not been neglected or idle. It is altogether probable that the past two years has witnessed more activity along industrial lines in those two sections than any other like period of their history. Within that time towns have sprung into existence where formerly forests only met the eyes of the traveler, and where small towns were may now be seen thriving small cities. Many of these small towns have actually doubled in size within 12 months, while others have grown from 1000 people to 3000, 4000, and some as many as 5000 within two or three years. Indeed, a steady and rapid growth has been the rule, and where no growth has been made it has generally been the fault of the people and has been proof of the assertion that those who migrate go where there is evidence of thrift and prosperity.

But more recently there has been aroused a spirit of energy in the eastern division of the State, and now towns are waking up to the importance of doing something to attract the homeseeker and investor, and another 12 months will probably have another story to tell about what they are doing in the way of building factories and interesting outside capital in them. The truth is, the eastern portion of Texas possesses more opportunities for development work than any other part of the State, but people there have been slow to see those opportunities and realize their great value. But the time has come when other sections need the things which could be produced from the raw material of the eastern part of the State, and if men of that locality will not make an effort to develop their resources, then men from elsewhere will take up the work and reap the harvest. The much-talked-of deposits of iron ore in East Texas constitute one of the most valuable resources of the entire State, while little is being done to develop it. Hardwood timber is another valuable asset. This, however, is now being looked after in many localities, and some important enterprises have been inaugurated within the past 12 months, and efforts are now being made to organize companies at different points for the manufacture of furniture and other useful articles from Texas hardwoods. Besides, several localities are endeavoring to interest experienced men with means to build and operate cotton mills at different points. In this work much home capital could be interested in such enterprises; even farmers would willingly take stock in them. In conversation with a gentleman from North Carolina a few days ago on the subject of cotton mills I learned that quite a number of mills of that State are owned almost exclusively by farmers, and he asked the question, "Why do Texas farmers not take hold of the cotton-mill business in the same way?"

One trouble in the past, not only about cotton mills, but also many other enterprises as well, has been a lack of cheap fuel or cheap power. Both difficulties are about to be removed. Many coal mines in different sections of the State are being opened and the output is being offered at $1.50 to $2.50 per ton. This has been found to be a good steam-producing coal, and will, no doubt, be available for all manufacturing purposes.

Another source of power which Texans have undervalued is found in many of the smaller rivers. Of these there are many positions along East Texas rivers where dams could be constructed capable of generating from 100 to 500, and in some situations as much as 1000 horse-power, by the expenditure of a few thousand dollars, and thus create means of inaugurating valuable enterprises in some much-needed line of manufacture. The dam now being built at Marble Falls will doubtless prove a valuable object-lesson along this line, and the growing spirit of enterprise of men of means of Texas will no doubt be equal to the emergency, and when once satisfied that it is practicable will be ready to join in the work.

An important part of the development of Texas is in railroad building. This work has kept pace with all other enterprises, and while I am unable to state the exact number of miles of road completed during the present year, it is evident that the total mileage runs well up into the hundreds. These roads have been, in the main, branches of trunk lines, but perhaps three or four main or trunk lines are included in the total mileage. Of these, a considerable section of the Kansas City, Mexico & Orient has been completed, and trains are now running over that route from Kansas City to San Angelo, Tex. This road is destined to reach the Pacific coast through Mexico, and will be a most valuable road for Texas manufacturers who desire to do an export business through the western part of the hemisphere. Another trunk line, just now being developed, is the Memphis, Paris & Gulf Railroad. It is intended to build this road through part of Arkansas, thence through North and East Texas and down to the Gulf of Mexico, and opening up much territory hitherto without railroad service. A charter has just been granted to the Oklahoma, Red River & Texas Railway Co. for an 80-mile line intended to build down through the black lands of North Texas, with a possible extension to the Gulf. In addition to these there are quite a number of short lines recently built or now building in Central and West Texas, each of which will open up new sections of valuable agricultural lands for settlement. South, Southeast and Eastern Texas are following the example of other sections of the State, and new railroad projects are being taken up and short lines are being built with a view to opening new territory. Taking 4,000,000 as the basis of population and 13,000 miles as the basis of mileage of railroads in Texas, we have approximately one mile of railroad to each 300 citizens and one mile of railroad to each 20 square miles of territory. With this meager showing financiers and railroad men will realize at a glance what a magnificent field this is for the investment of capital.

Another interesting feature about the development of Texas which is worth consideration is the character of people coming here from other States. It is a fact well known that old fogies rarely ever change their place of residence, therefore it follows that those who do are men of energy and enterprise. That is the kind of people who do things, who venture out into new and unknown countries and blaze the way for civilization. That is the kind of people who are now coming to Texas, and who will in the next decade help to transform the hitherto waste places into habitations of the most enlightened people on the American Continent. Every year witnesses some important change for the better throughout Texas, but the next 10 years will bring changes which will amaze the most optimistic.

But why should Texas not become one of the greatest industrial States in the Union? With an area greater than any other four States in the South, and greater than any other two States in the United States; with an area of lands yet unimproved exceeding 100,000,000 acres of tillable and fertile soils available for the homeseeker; with 30,000,000 acres of standing merchantable timber, estimated to cut about 10,000,000,000 feet of lumber for building homes for the homeseekers; an area of 55,000 square miles of coal, with an estimated yield of over 30,000,000,000 tons; 30,000 acres of iron ore, estimated to yield at least 150,000,000 tons of ore; immense petroleum resources, now yielding approximately 12,500,000 barrels per annum; with one large and numerous smaller streams available for water-power to aid in the conversion of these vast resources into manufactured product—is it an unreasonable claim to say that Texas is destined to be the greatest State on the American Continent?

There is no available data from which to estimate the increase in the commerce of Texas. But through the various custom-houses of the State it can be stated that imports have increased from $5,606,360 in 1900 to $11,325,127 in 1909, while the exports have increased from $105,985,258 in 1900 to $225,048,657 in 1909. The increase of imports is not so important, but that in exports is especially so, being over $13,000,000 per annum for the past nine years. With the new ports being opened every year and with a rapid increase of production of all field crops and manufactured products the export commerce of Texas and tributary territory we may certainly anticipate reaching the $500,000,000 mark before 1920. As an example of the rapid increase of grain production the corn crop of the State in 1900 was 81,962,900 bushels, while in 1908 it was 202,000,000 bushels, an annual increase of 15,000,000 bushels. But with the rapid increase of population through immigration it is reasonable to anticipate a greatly accelerated increase for the next 10 years in all agricultural crops. This, added to the increase of production of Arkansas, Oklahoma and Kansas, a large per cent. of their products finding outlet through Texas ports, will help to swell the business of all Texas ports of entry.

But I desire to call attention to the fact that within the present year a comparatively new element has entered into the spirit of progress of Texas people. This is an awakening of the people to the importance of enlisting capital in manufacturing enterprises. This spirit appears to have taken hold of almost every city and town in the State, and it is wonderful to see how rapidly those people are making the discovery of valuable natural resources which they had formerly regarded as not only valueless, but in many instances as hindrances to their development. One town, for instance, made the discovery that a certain rock which they had anathematized in unstinted measure for many years was the very material they needed for surfacing their public roads with, and besides was, when burned, a lime-making rock. Another town found that an insignificant sand was the identical material that glass is made from, and is now making strenuous efforts to enlist capital in a great glass factory. These are only a few of the many instances which are taking hold of the people and bringing them in line with the spirit of progress of this day and age, and promises to make Texas one of the greatest manufacturing States in America.

Another thing which is proving helpful in the work of development in the State is the fact that people abroad as well as at home are becoming better informed on matters pertaining to Texas opportunities and Texas laws. On the latter especially there has

been a wrong estimate of the nature of many of the laws of Texas, and as people become better informed they realize the error in that regard. It is undeniably true that there have been some laws placed on the statutes of Texas which, to say the least, were ill-advised, but many of those laws have been declared unconstitutional, while others have been repealed, and still others modified to bring them within reasonable requirements of an enlightened and progressive people, and it is entirely within the bounds of reason to anticipate that all really objectionable laws or features of laws will be eliminated as fast as the requirements of the State may demand. Texas is no more immune to the baleful influence of demagogy than any other State, and therefore it is quite unjust to single out this State and hold her people up to ridicule as an exception of political depravity, while practically every other State in the Union has the same difficulties to contend with. We are all working for the same destiny, only we do not all seek that end by the same route, and it may be that jealousy may figure in these matters just as in personal matters.

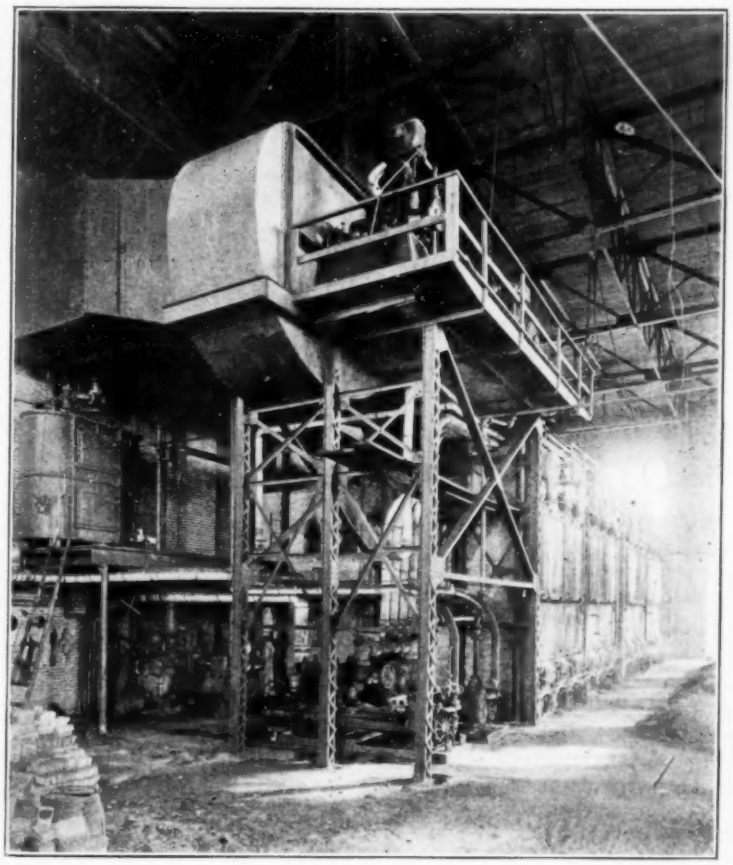
However that may be, Texas, be it remembered, is big not only in superficial area, but in every aspiration, in every impulse, in every thought and every act, and will be found eventually at the head of all things American, the biggest from industrial, commercial, financial, as well as intellectual standpoints, as indicated by the progress made along these lines during the past year or the past few years.

Interurban Railway Development in the South.*

By J. W. Billingsley, C. E., New Orleans Manager of the Fred A. Jones Company.

A review of the engineering publications for the past four years shows that in the South there have been projected several thousand miles of interurban railways, indicating that the South is fully alive to the value of interurban railways in building up its country districts by facilitating transportation of persons, express matter and light freight. The Pacific Coast, Northern and Eastern sections of our country are fairly well built up with interurbans (especially Ohio, Indiana and Illinois), and are a justification of the South's attitude in regard to this question. There is no question at all that an interurban built practically in any place in this country will assist in the development and building up of the adjacent territory, even though the interurban railway is not a paying proposition to the investor.

An examination of the Street Railway Journal's Investment Book shows that in

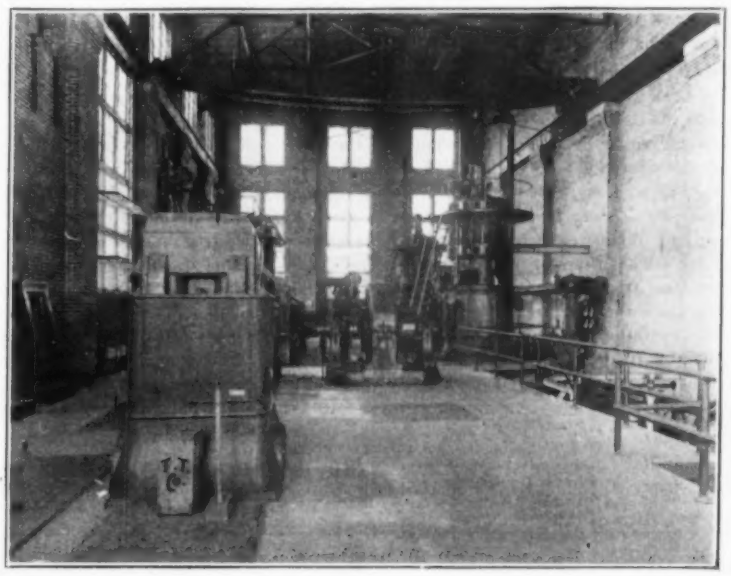


BOILER-ROOM OF MAIN POWER STATION, SHERMAN-DALLAS INTERURBAN.

the States of Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Tennessee, Alabama, Georgia, Florida, South and North Carolina there are approximately 200 miles of completed interurban railways, which is a very small percentage of the total mileage in the United States. The reason in many cases is due to the fact that the population is not sufficiently dense to support an interurban railway, and in the case of an interurban proposition which would pay, that the promoters do not present their proposition in a way to interest outside investors. A proposition of this character should be presented with a workable plan of financing same, which plan should indicate just what amount of local support in the way of stock subscriptions could be secured.

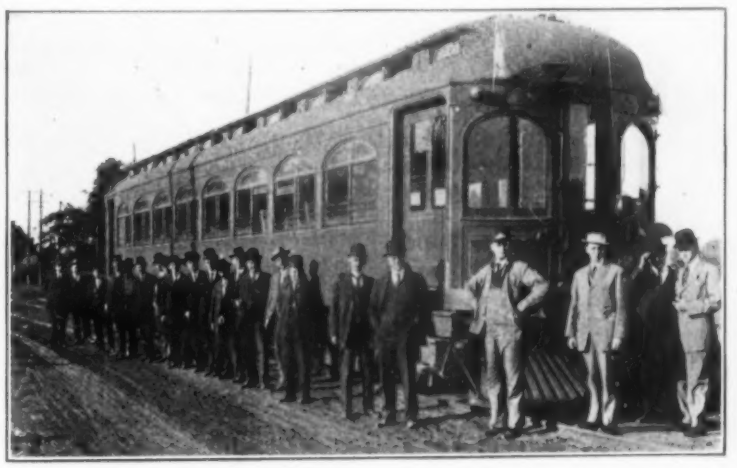
The bond investment houses are cautious about investing in propositions of this character, the reason of which is very apparent upon examining the operating statements of lines already built. For instance, an examination of the street railway and interurban properties in the State of Ohio shows that there is a total of about 89 properties, many of which are consolidations of a number of individual railway systems. Fifty-eight of these properties give statements showing net earnings (gross, less operating expenses and fixed charges), and it is interesting to note that 18 of these 58 properties show a deficit for the last two years, 6 show deficit for one year and slight earning for the other, and 8 of them show a very slight earning, making a total of 32 properties which are a poor investment to the bondholder. This is particularly so, inasmuch as very few of these properties which are showing such slight earnings or a deficit are probably properly maintaining the physical condition of their property. Thus in the State of Ohio 55 per cent. of the properties showing operating statements and 36 per cent. of the total number of properties offer a questionable security to the bondholder. It is true that a number of the above properties that are not paying are short lines, and probably some of them have been built mainly with the view to enhancing the value of real estate tributary to the line, and it is quite possible that the investors have realized sufficient from their real estate holdings to justify the building of their lines.

It is quite evident from this, and from examination of properties in other parts of



MAIN POWER STATION, SHERMAN-DALLAS INTERURBAN.

the country, that there are many interurban lines that are losing investments, due in some cases to poor judgment in the location and construction of the line, or to inefficient management, but in most cases due to the fact that there is not sufficient traffic between the termini to justify the building of them. And so it is for this reason that the people of the South and in other sections have difficulty in interesting bond houses in investing in their interurban properties unless the proposition is handled in a thoroughly businesslike way and is shown to be a safe investment. Many promoters in sending out their prospectus to bond houses receive replies apparently indicating that the bond houses will handle the bonds, always, of course, with the proviso that an investigation be made by their engineers to show conditions to be as represented. In many cases this attitude on the part of the bond houses is simply to insure that, should the proposition be safe, they will be in line to participate in the bond underwriting. It is for this reason that in looking over the engineering publications for the last three or four years we see so many statements from the promoters to the effect that bonds have been sold



FIRST THROUGH CAR FROM DALLAS INTO DENISON, APRIL 30, 1909.

and construction work will start within a few weeks. This often results in many local stock subscribers paying in their subscription, which money, in a number of cases, is spent before bonds had been underwritten or sold, and the usual consequence of this is that after several thousand dollars of the money realized from local stock subscriptions has been spent the work comes to a standstill.

Interurban railways may be classed as those running between towns and cities carrying passengers, express parcels, and in some cases freight. As built in this country, such lines range from very short distances of four or five miles up to 80 and 90 miles in length. Of course, there are consolidated systems which are many miles longer than as above stated, such as the Terre Haute, Indianapolis & Eastern Traction Co., which system controls and operates 363 miles of track.

Interurban railways usually connect towns which have been developed by steam railroads, and where a freight and passenger traffic has already been created. In a number

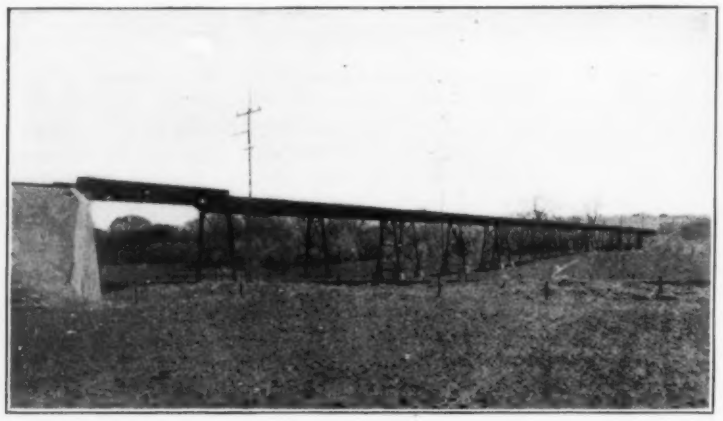
*A paper delivered before the Louisiana Engineering Society.

of cases, however, as in the western part of the United States, interurban railways have been built to develop country not served at all by railroads. This is not often the case, however, because an electric railway, on account of larger investment, is not an economical means of accomplishing this result where the passenger traffic is infrequent, and consequently where a frequent schedule would not be necessary. There are some conditions which warrant handling considerable freight by electrical traction, as in the case where the cost of fuel is high and where water-power may be utilized for generating electrical energy for operating cars, as in the case of the Spokane, Inland & Empire Railroad Co., some parts of which are doing an extensive freight business. In the western portion of the South the cost of a high-grade electric interurban railway, including rolling stock, power plant, etc., will run from $27,000 to $34,000 per mile, or about twice as much as a steam railroad; consequently, the fixed charges will be double that of the steam railroad and the cost of hauling per ton mile will be much more than that of a steam line. So it is well to realize that in general the electric railway is essentially adapted to handling a passenger and express traffic and a light freight business. I make special reference of this point, inasmuch as I have noted in the engineering publications that in many cases it has been the impression from the promoters' standpoint that freight could be profitably handled by an interurban in partially-settled sections.

Quite often in partially-settled sections a profitable scheme of transportation is to handle the freight business by means of steam trains and to handle the light express and passenger traffic by means of gasoline, gasoline-electric or steam-motor cars. This is desirable where the lines are long and where the passenger service is infrequent, requiring cars to operate, say, once in every three hours or longer. Such service on the part of the motor cars is more frequent than could be given by regular steam trains, and more closely approximates the cleanliness and convenience of electric railway service without the attendant power plant, substation and trolley investment. This condition will some time arise in the South and Southwest on branch lines and short independent steam lines where the freight service is not so frequent that it would be interfered with by the operation of motor cars, but where it is desired to develop the passenger traffic by offering frequent and acceptable service. Operating statements of a number of gasoline motor car lines in the West show that the cost of operation per car mile, including fuel, labor, maintenance, etc., amounts to 12 to 19 cents, depending on local conditions.

Financial.

The vital point under consideration as affecting interurban development in the South today is the fact that in almost every instance the money necessary for building



CHOCTAW CREEK VIADUCT, SHERMAN-DALLAS INTERURBAN.

same must be secured from financial centers located in the North and East, who must receive their return on their investment from the net earnings of the interurban, they not profiting by any enhanced value in tributary real estate, which would benefit only the local investor, but which, of course, would ultimately mean larger net earnings to the interurban itself.

A logical method of procedure in building an interurban railway is for the local people who are interested in its construction to form an association, members of which put up sufficient money to make, first, the preliminary report to satisfy themselves whether or not the interurban will be a paying proposition; then, if favorable, to make surveys, financial and engineering reports to properly present the proposition to the outside investor. As a rule, this association should provide sufficient money for securing rights of way and of defraying the general expenses attendant to the underwriting of the bonds. The bond underwriters will usually require that at least 20 to 25 per cent. of the money required for construction be secured from stock subscription, usually placed locally. It is further required that all or part of the money so secured shall be spent on construction work before calling upon bond underwriters. After the bond underwriters have been called for, say, about 20 per cent. of their underwriting, it is generally possible to secure a loan on the bond underwriting to carry on the work to completion.

Of course, in some instances the money for construction is simply furnished by private interests, and the line is built without stock subscription or underwriting, in which case the financing is much simplified.

Reports.

The outside investor, usually a bondholder, must be assured of a safe return on his investment within a period of at least one year after commencement of operation, and so the vital point to determine in considering an interurban railway is, first, how much will the property earn, and how soon. So it is of primary importance that a careful and correct study and estimate be made of the question of probable revenue. It is for this reason that I will deal at some length with the question of the methods best adapted toward making accurate reports and investigations.

The reports necessary for properly considering an interurban proposition are:

First.—Preliminary report.

Second.—Engineering, financial and statistical reports.

Engineers, in making preliminary reports on interurban railways, often make the mistake of giving undue importance to the item of cost of construction and to the physical features of the line.

The object of the preliminary report is to satisfy the promoters and other parties interested that the interurban will be a paying proposition. Only those matters should be considered in this report that will affect to a considerable degree the question of net earnings. The object of this report should be to gather sufficient data as regards existing traffic conditions and probable traffic conditions between the termini of the road, and to prepare construction and operating estimates in sufficient detail only, to ascertain whether or not the net earnings will be sufficient to justify the making of surveys, the financial and engineering reports proper. As a rule, in this preliminary investigation it is not necessary to go to the expense of making surveys, as the only object of the survey would be to more accurately determine the cost. The survey would enable you to determine accurately principally the cost of earth work, unless there be much bridge construction. Inasmuch as this item of earth work amounts to only from 8 to 12 per cent. of the total cost of the construction in this section of the country, it is evident that a discrepancy of even 25 or 30 per cent. in estimating this item would affect the total estimate of construction only 3 or 4 per cent.

Special attention, however, should be given to the gathering of reliable traffic data between the termini of the interurban. It is interesting to note that a difference in estimates of cost of construction of $100,000 would make a difference in the net earnings of approximately, say, $5000, whereas a difference of only about $8000 in estimate of gross earnings would change the net earnings by the same amount, from which it is evident that a report of this character should deal more particularly with the estimate of revenue than with the detail cost of construction.

It is of value in a report of this character to check up estimates by comparing the proposed line with other lines operating under as nearly similar conditions as possible. A check of this kind is of value, yet too much reliance should not be placed on such a check unless the lines are located in the same section of the country and serve similar traffic conditions. For instance, the travel in a somewhat undeveloped country which is rapidly growing is in some cases 40 to 50 per cent. greater per capita than in old and more settled communities. I know this to be especially true of Texas and Oklahoma. Further, interested parties may often be led to erroneous conclusions by estimating earnings on a basis of so much tributary population per mile of track. Examination on my part of 10 interurban lines at random in the Middle West show earnings ranging from $2.30 per capita up to $11 per capita, and hence it is very evident that an

TRACK CONSTRUCTION, 80-POUND RAIL, SHERMAN-DALLAS INTERURBAN.

erroneous result might be arrived at by using such a method alone in estimating gross receipts. This question of estimating gross earnings is by far the most difficult and important part of a report of this character, and consequently it is necessary to study the local conditions very carefully as regards habits of people, occupation and all other local phenomena. In several cases, in making preliminary reports, I have had statisticians spend several weeks counting passengers handled by parallel steam lines, wagon and pedestrian traffic and estimating express business. Inasmuch as local conditions are different in nearly every situation, only a study of such conditions will indicate the best methods to be adopted in estimating existing travel and traffic, and estimating what portion of this would be handled by the interurban, and how much the building of the interurban would increase traffic.

If the preliminary report should be favorable and it should be decided to attempt the financing and building of the interurban, then the next thing to do is to make surveys, showing right of way that will be required, and to make detail estimates showing cost of construction and cost of operation. A statistical report should be prepared showing in detail business conditions in the tributary territory, all data and information pertaining to which being supplemented by sufficient photographs. These reports should be gotten up in detail, so that the outsider who is not familiar with local conditions may from these reports get a correct idea of local conditions and what results may be expected should the interurban be built.

Location.

The interurban railway should be built as much as possible on private right of way, and should seek to obtain as short entrance as possible into the termini of the line. It is generally necessary to reach the center of the terminal cities, especially if there be competing steam lines, but it is very essential to make this entrance as short as possible, inasmuch as it very often happens that a very considerable part of the total running time will be taken up in getting out of the city and to the private right of way. I know of one instance of a 65-mile line where 15 per cent. of the schedule time is occupied in getting out of the larger city. Although it is generally desirable to reach the heart of the terminal cities, it is not always necessary to do so in the small intermediate towns. It is desirable to run on private right of way as much as possible, and so, if, in order to reach the center of one of the small towns, it would be necessary to pass along the

main street of said town (which is quite often built up to a considerable extent on either side of the town), it would possibly be better to pass through the edge of the town instead. People in a small town are willing to go to more inconvenience to get to an interurban waiting station than they would be in a larger city, especially where the main station of the competing steam line is located close to the heart of the city. It is more possible in this section of the country and in the Middle West to secure private right of way than in the more hilly and built-up sections in the Eastern States, where as a consequence many of the interurban lines follow the highways to avoid heavy cuts and fills, and to avoid the expense of obtaining private right of way. This results in a line with a crooked alignment, slower speed of operation and more risk of accidents. By all means an interurban should be located on private right of way as much as possible.

Physical Characteristics and Motive Power.

The physical characteristics of a road depend largely upon local conditions. Should there be paralleling steam lines it is generally advisable to build an interurban such as could provide a high-speed service. This means heavy rails, probably catenary trolley construction, in some cases block-signal system, reserve equipment in power plant, and large cars. However, if there should be no competing lines, then in that case the line should be built to best serve traffic conditions, and this would not necessarily mean a high-speed line.

There are three systems of motive power in use in this country, viz.:

600-volt direct-current system.

1200-volt direct-current system.

Single-phase alternating-current system.

The 600-volt direct-current system operates at a trolley voltage of 600, and most of the installations built use this system. Often the interurban railway is of such length as to require substations, and in this case alternating-current power is transmitted to these substations and transformed by means of rotary converters or motor-generator sets.

The 1200-volt direct-current system operates at a trolley voltage of 1200 volts, and has been made possible by the development of the commutating pole motor. Within the past three years several roads have been built using this system, conspicuous among which is the Indianapolis-Louisville Line, which operates a 41-mile section without the use of substations.

The single-phase alternating-current system uses single-phase alternating-current motors operating with a high trolley voltage stepped down through transformers on car to a suitable voltage for the motors. In general, there are no reasons why the trolley should not carry a potential of 11,000 volts, under which conditions a very heavy service (as in the case of heavy freight traffic) can be handled without an excessive amount of copper in the transmission conductors. There have been many single-phase systems built within the past few years.

The only high-speed interurban railway built and put into operation in the far South in the past four years is the Sherman-Dallas Interurban (built by the Texas Traction Co.), in North Texas, connecting Dallas with Sherman, a distance of 62.5 miles. Inasmuch as this line is a thoroughly first-class installation, it would probably be interesting to you if I should describe some of its principal features.

Location.

Fifty-three and one-half miles of the line are located on private right of way, and nine miles are within municipal limits. The right of way averages about 80 feet wide.

The limiting curvature on private right of way is 3 degrees; however, there are some curves of 50 feet radius in the streets of Dallas. Grades are generally 1.5 per cent., a few 2 per cent., one 4 per cent. grade in the streets of McKinney.

Bridges and Trestles.

There are 12 steel structures for stream and railway crossings, including a steel viaduct 735 feet long. There are a number of timber trestles, the longest of which is 1876 feet long. Bois D'Arc or oak piling is used in all trestles.

Roadway.

No very deep cuts or fills were encountered, the average yardage being about 16,000 yards per mile. The track is laid with 80-pound A. S. C. E. rail in 33-foot lengths on 6x8-inch by 8-foot ties spaced 17 to the rail length.

All track is bonded with one No. 0000 bond 9 inches long, one bond per joint. Heart pine and oak ties were used untreated, but all sap pine ties were treated by the Allardyce process or dipped in hot carbolineum for three minutes.

General Plan of Electrification.

The railway is operated by 600-volt direct current, the transmission circuits being three phase, 19,100 volts, 25 cycles and delta connected.

Power is supplied from a single generating station at McKinney, near the center of the line. One rotary converter is located in the power station, and four 300-kilowatt rotary substations are distributed along the line.

The power station contains two 1000-kilowatt Curtis turbine generating sets, furnishing 2200-volt three-phase current, which is stepped up to the transmission voltage through a bank of air-blast transformers.

The power plant is planned for an ultimate capacity of 3000 kilowatts.

Boilers and Auxiliaries.

The boiler plant consists of four 525-horse-power B. & W. boilers, equipped with Foster superheaters designed to give 150 degrees superheat. The induced-draft equipment (furnished by the B. F. Sturtevant Co.) consists of duplicate fans and engines, each set rated for 2000 boiler horse-power when burning bituminous slack or lignite.

The condensers are of the Worthington jet type, with volute discharge pumps, the condensing water being taken from an artificial lake adjacent to power plant.

The exciters are 35-kilowatt horizontal Curtis turbine sets, and operate at 125 volts, 3600 R. P. M.

The switchboard consists of 16 slate panels, six of which are blank for future use. The oil switches are of the motor-operated type, controlled by 125-volt direct current from the main board.

The transformers in the generating station are air-cooled. Three 330-kilowatt transformers are connected to each generator, and three 110-kilowatt transformers to each rotary converter.

The rotary converters are 300-kilowatt 600-volt compound-wound machines, and are started on transformer taps from the alternating-current end.

Car House.

The car house is not yet completed, but is to be of brick, 81 feet by 183 feet 6 inches, divided by fire wall into car storage room and shop section.

Substations.

There are four substations, located an average distance apart of 13.9 miles. Each contains a 300-kilowatt rotary converter, with space for an additional unit. The substations at Plano and Van Alstyne have frame additions, providing waiting and baggage rooms.

The company also has a portable substation of 300 kilowatts capacity.

Overhead Lines.

The transmission and trolley wires are carried on a single line of poles of Idaho cedar, the standard pole length being 40 feet, with seven-inch tops.

The trolley is a No. 0000 copper wire, with General Electric three-point catenary suspension throughout, except in terminal cities, where span construction is used.

The transmission wires are No. 1 stranded aluminum carried on a single crossarm and supported by Ohio Brass Co.'s three-piece porcelain insulators, designed for 35,000 volts working potential.

The feeder is stranded aluminum, 477,000 C. M.

Dispatching System.

A complete telephone line is provided for dispatching and general operating communication.

Rolling Stock.

The principle rolling equipment consists of 10 passenger cars and two express cars, built by the St. Louis Car Co. The passenger cars are 57 feet 6 inches long over all, and have a seating capacity of 62. The equipment of each car consists of four G. E.-73 motors, with type M control. The inside finish of car is mahogany.

Organization.

The Texas Traction Co. was chartered in 1906, and has $2,000,000 common stock and $1,000,000 preferred stock. The company has also issued $2,000,000 5 per cent. bonds.

CHURCH BUILDING IN THE SOUTH.

By R. H. Hunt, Architect, Chattanooga, Tenn.

[Written for the Manufacturers' Record.]

That the character of church building in the South has kept pace with the improvement in other lines is apparent to the observer of the great number of costly edifices that are constantly going up throughout the various States, and in many of these edifices are provided every convenience needed by the modern church organization, these buildings having been developed to meet these needs. No more is the rectangular church building, with a spire in the center or corner of the main front, and providing only one large room for the regular preaching services, the rule, but the modern church must provide a good auditorium for these preaching services; there must also be a commodious Sunday-school department, with its main lecture-room for the week-day service, adequate primary department, ladies' parlor, large rooms for both the Baraca and Philathea classes, large junior room, library and a number of small and medium-sized rooms for intermediate classes. A large social-room and kitchen is also considered a necessity, which are usually located in the basement. In many instances rooms for institutional work and special training in connection with the Sunday-school are provided.

FIRST BAPTIST CHURCH, MOBILE.

In some cases church buildings are so arranged that by means of large sliding partitions between the main auditorium and the Sunday-school department the entire building can be thrown together, thus providing for their large gatherings on special occasions. In other cases, where the arrangements are equally complete, the Sunday-school is separated from the main auditorium by a solid partition. This idea of completeness of arrangement seems to have been generally applied, even to the medium and low-cost church buildings; in fact, the village chapel is often seen with its auditorium large enough for all the regular services of the church, surrounded by parlor and classrooms so arranged as to be thrown in with the main room on special occasions.

There is also noted a material change in the styles of architecture employed in our churches. The tall spire has given away to the medium tower, which is now seen on

most all our church edifices; in fact, many good churches are built without towers. The styles of architecture have also varied greatly, the Gothic, perhaps, prevailing, but many churchs are seen in the Romanesque and other styles. Recently, however, many of our best churches are being designed in the classical orders; in fact, there seems to be a very decided tendency in this direction all over the country.

In this issue is shown cut of the new building now being completed for the First Baptist Church (formerly the St. Francis Street Baptist) of Mobile, Ala., which is in the Doric order, which is built of stone and finished in elegant style throughout at a cost of about $95,000.

In this building is provided a main auditorium which will seat 1000 people. This room is carried out in the Doric order, having pilasters at the side and elegant paneled ceiling appropriately ornamented. The glass is of simple design and harmonizes beautifully with the rest of the building, and altogether the auditorium presents a most elegant appearance.

The main Sunday-school department is divided from the main auditorium by a solid partition. The basement of this department provides the primary department, ladies' parlor, kitchen, heating plant and fuelroom. On the main floor of the Sunday-school are located the main lecture-room for Sunday-school and the week-day meetings; large classroom, 20x48 feet; library, and eight classrooms of medium size. This floor is so arranged as to be thrown together, providing a combined seating capacity

TABERNACLE BAPTIST CHURCH, RICHMOND, VA.

ATLANTA TABERNACLE INSTITUTIONAL CHURCH.

of 500 people. In the second or gallery floor are located large rooms for the Baraca and Philathea classes, pastor's study and six classrooms, the latter being so arranged as to be in good view of the main lecture-room. This whole Sunday-school department is well lighted, and, besides being a very convenient arrangement, presents a most pleasing appearance.

There is also shown in this issue a cut of the large Broughton Tabernacle which is being erected at Atlanta, Ga. This will be the largest church building in the South and one of the largest in the country. The main auditorium provides a seating capacity, including the balcony and gallery, for 3000 people. In the choir alone 200 seats are provided for. There is also provided a large space for the orchestra.

The Sunday-school department is located in the basement of this building. This school is to be divided into six different departments, all so arranged that the superintendent may control any one or all of the partitions from his platform by means of electric buttons.

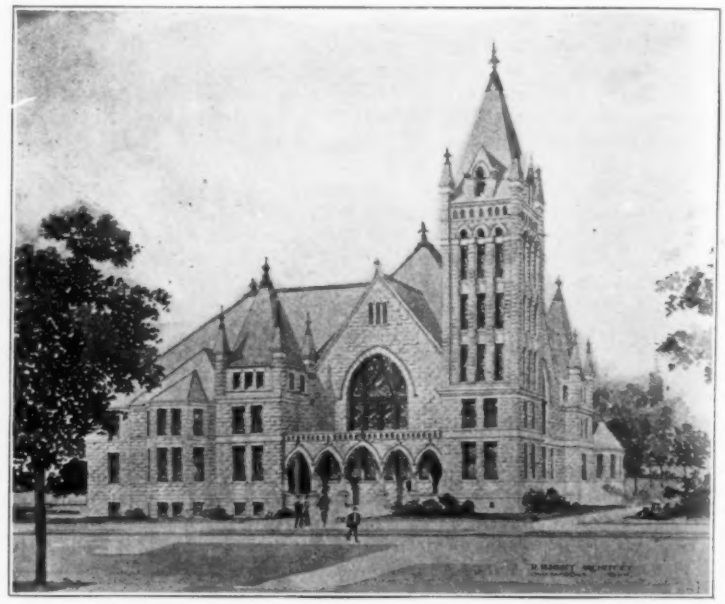
In this building is also provided a pastor's study, regular business office for the church, large parlor, library and reading-room for men, a number of large classrooms for special institutional work, and the whole seating capacity of the Sunday-school department is about 1500.

This tabernacle is also designed in the classic style, being in the Ionic order. While it is the purpose of Dr. Broughton that there shall be no money spent for useless ornamentation, this building will be finished and furnished throughout in first-class style, both inside and out.

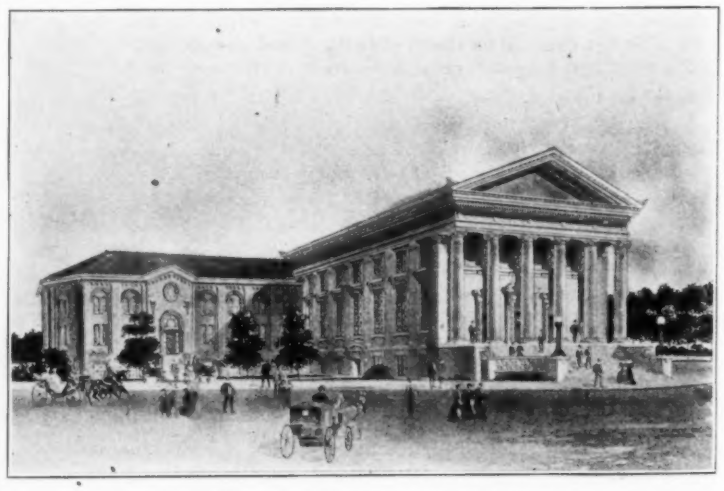
The new building recently erected for the Central M. E. Church at Asheville, N. C., has a main auditorium which, together with the gallery, seats about 750 people. The Sunday-school has a large lecture-room, 40x42 feet, surrounded by a parlor and five good classrooms, all so arranged as to be thrown in with the main lecture-room. There is also located on this floor the main primary-room, library and pastor's study. On the gallery floor of the Sunday-school department are located large classrooms and four medium classrooms. In the basement are provided kitchen, boiler and fuel room, etc.

The main auditorium and Sunday-school are divided by means of a large sliding partition, which makes it possible to completely throw the two departments together for special occasions, providing a combined seating capacity of 1250. This building is in the Gothic style, being faced on the outside with stone and finished inside throughout in quartered oak. The windows, especially in the main auditorum, are exceptionally fine. The church is also nicely frescoed, thus making a very complete, attractive church property in every respect. This building was erected at a cost of about $65,000, including the furnishings.

Plans for the main auditorium to be erected for the South Side Baptist Church at Birmingham, Ala., provide for an auditorium 62x82 feet, which, together with the small gallery at the rear, provides a seating capacity of 1000 people. The basement



CENTRAL METHODIST EPISCOPAL CHURCH, ASHEVILLE.



SOUTH SIDE BAPTIST CHURCH, BIRMINGHAM.

is to be used for the Sunday-school. In this is provided a large lecture-room, together with a number of classrooms.

This building is also designed in the classical style, to be in the Ionic order. The six large columns in front are to be marble; the main base of the building, including the front steps and terrace, is to be of granite, and the walls above this base will be faced with a very light vitreous brick trimmed with terra-cotta.

The interior of the main auditorium will be finished in mahogany throughout, including the furnishings. The walls will have pilaster finish and the ceiling will have a heavy panel treatment, appropriately ornamented, which will make of this an exceptionally fine building.

Designs have been prepared and work will soon begin on an elegant new church building to be erected for the Tabernacle Baptist Congregation at Richmond, Va. This building will provide a main auditorium, which, together with the gallery, will have a seating capacity of about 750 people. The main Sunday-school lecture-room will seat about 300, and is surrounded by a large parlor, and junior room that will seat 250 more, making a total seating capacity on the first floor of the Sunday-school 550. There is also located on this floor the main primary and beginners' rooms, with a capacity of about 150.

On the second floor is provided a large Baraca class with capacity of 125, Philathea class for 75, and eight other classrooms which will have a combined seating capacity

of 115, making 18 classrooms in the Sunday-school department, besides the main lecture-room.

There is also to be provided a full basement under the Sunday-school department, which, however, is to be left unfinished ready for the future needs of the congregation.

The main auditorium of this church is divided from the Sunday-school department by means of sliding partition, which makes it possible to throw the two departments together on special occasions. The combined seating capacity, in full view of the rostrum when thrown together, will be about 1500 people.

This building is designed in the English Gothic style and is to be finished in first-class manner throughout.

TYPICAL BUILDING IN THE SOUTH IN 1909

By William H. Stone.

[Written for the Manufacturers' Record.]

Strikingly evidencing the stability of the South's progress is the substantial and modern character of the many structures being erected for the conduct of its various and growing industrial and business enterprises. At the beginning of the South's rehabilitation, after the war, the various business structures were of a necessity plainly and economically constructed, and contained only such equipment as was absolutely required for the conduct of business; but as the South has advanced in prosperity the old structures have been replaced by larger ones, and many of these have in turn given way to still better ones, until today there will be found in all parts of that section some of the finest examples of buildings devoted to the manufacturing, commercial, financial and general business enterprises. As the greater number of these structures were erected within the past ten years, and by far the greater part of these within the past five years, those planning them were able to take advantage of the most modern ideas of the day, both as to materials for the construction and as to interior equipment. The result, which is apparent to all who observe as they travel through the South, is that scattered throughout all parts of it can be found magnificent buildings equipped with all modern facilities. In this work of erecting buildings in keeping with the growth and prosperity of the various businesses millions of dollars have been spent annually and will continue to be spent each year in even increasing amounts, because of the many varied and valuable resources which the South contains and which are being more and more recognized and broadly developed. The effect of this development makes itself felt in every line of business, and all receive from it a share of the prosperity which it brings, which means an increasing of their own capacities to take care of the larger demand.

One of the most important necessities to all lines of business is proper railroad facilities for the shipment and handling of raw materials and finished products. Although the railroads of the South are not, in the busiest periods, fully prepared to handle promptly and quickly all of the business that comes to them, they have done and are doing much each year to increase their facilities. In addition to improving and enlarging their roadbeds and purchasing new rolling stock, they are continually building new freight and passenger stations, erecting new terminals and warehouses and constructing wharves and docks. In co-operation with the various steamship lines, splendid dock facilities are being added each year, and today in the various ports along the Atlantic and Gulf coasts can be seen some fine examples of modern terminals. One of the most notable of terminal improvements in the South is the magnificent facilities being established at Texas City, Texas, by the Texas City Transportation Company. This company has planned and has in the course of construction what will be one of the most complete and modern terminals in all details in the world. In the leading ports along these coasts—Galveston, New Orleans, Brunswick, Savannah, Charleston, Wilmington, Norfolk, Newport News, Baltimore—the work of erecting suitable terminals to handle increased business is going steadily forward.

The many varied classes of structures needed in the manufacture of finished products from the South's raw materials are becoming more and more modern in all respects; not only are these buildings being constructed to meet the demands of each particular industry, but are being substantially built, many being of fire-proof material.

In equipping these new structures, the owners have been far-sighted enough to install the most improved machinery and appliances of the day, realizing that it is only by using such equipment that they can successfully compete with the manufacturers in other sections of the country. Indeed, it is a well-known fact that in many instances some of the new reconstructed plants contain equipment far in advance of that in similar older establishments in other parts of the country. In the use of motors for individual drive for special machinery some of the Southern manufacturers have been especially alert and have successfully demonstrated their value for purposes for which individual motors were never considered feasible. So in the adoption of other machinery they are taking advantage in building new plants or equipping old ones to buy the latest design. This tendency, of course, is not a general one, but it is being followed more and more every day, and strongly evidences the spirit of progressiveness that is being manifested by Southern manufacturers.

The textile industry of the South is advancing wonderfully, both in the character of buildings erected and the class of machinery installed. The buildings now being put up for this industry are notable in possessing the best ideas of modern cotton-mill construction. In equipment, the type of machinery being used is steadily becoming the best that is made. Moreover, Southern mills are gradually but surely advancing in the grade of goods turned out, and it will not be many years before the finest grades of goods made from cotton will also be manufactured in the South in large quantities. What is true of the textile industry applies also to the many other industries of the South. In lumber and woodworking plants, foundries, machine shops, coal mining, fertilizer plants and numerous other varied industries, the attention which is being given to economical manufacture through the use of specially designed and constructed buildings and equipment is steadily growing. The establishment by some of the largest industrial corporations of the country of branches in the South has had a healthy influence along this line, because it has brought home to the Southern manufacturers that it is only by adopting up-to-date methods that they can successfully compete with others. There is no question but that the coming of the United States Steel Corporation in the Birmingham iron and steel district through the purchase of the Tennessee Coal and Iron Company, and the betterments and enlargements that they are making at the expenditure of millions, will give a stimulus to the improvement and modernizing of other plants engaged in similar or allied lines. The influence of such modernizing is felt in many different directions. Those who manufacture or deal in supplies find the growing demand for a higher grade of product, and they in turn, in order to keep up with the procession, must broaden and raise their standard so as not to be left behind.

Thus are the industries of the South advancing hand in hand. The raising of standards by one brings about the necessity for others to do the same. No better evidence of this can be pointed out than by referring to the fact that leading manufacturers of and dealers in supplies and equipment of all kinds in various parts of the country are more and more each year turning toward the South as a section which is offering a splendid field for sales and one that is worth earnest efforts on their part to cultivate. Realizing this, not only are they sending their representatives in this territory, but are also establishing permanent branches, offices and agencies in its leading cities.

The prosperity of a section is always reflected in the growth and prosperity of the leading cities and towns in that section. In these cities and towns will be found the leading financial institutions and other important businesses, which must of necessity be established at a point where they can conveniently reach out and keep in close touch with those in the surrounding country with whom they do business. With the growth of these various businesses has come the demand for a better class of structures in which to maintain offices and conduct the various manufacturing, warehouse and mercantile establishments, and consequently many new structures, especially fitted out to meet these various requirements, have been built, such as hotels of the better sort to accommodate the increased number of travellers constantly visiting this section; especially designed banking houses, large office buildings, commodious warehouses, industrial buildings for many different purposes, stores for commercial establishments of all kinds and various other buildings devoted to one particular business or another. The South had long been noted for its poor accommodations for the traveling public, but with the building of new, improved hotels in all parts of it these conditions are rapidly changing, and the visitors are finding each year better accommodation and conveniences, equaling those found in any other cities of the country. These new hotel structures are not only being built of fireproof materials, but they contain all of the latest equipment necessary for the convenience and comfort of the traveler. In the way of modern office buildings, the Southern cities are also coming to the front, and very few of the larger towns are now without their skyscrapers, while in the principal cities these abound in large numbers, ranging in height from ten to twenty stories, and containing fast elevator service and all other requisites necessary to the conduct of business and comfort of the occupants.

With increasing prosperity, much attention has also been given to the erection of modern structures for the conduct of public business, this finding expression in the many commodious buildings being erected by cities, counties, towns and States, such as city halls, public school buildings, county courthouses, State capitols and other public institutions of a varied character.

In the construction of all these high-class buildings advantage has been taken of the great advance that has been made in the class of building materials now in general use. Fortunately this advance came at a time when the South was in a position to reap the full benefit of it, after experience in other sections of the country had demonstrated the adaptability of these materials for structural purposes. Principally among these materials has been the use of Portland cement. This wonderful material, which has been found adaptable to all classes of building work, has steadily advanced in use from about 1880, which was about the same time the South began its real work of rehabilitation. As the production of Portland cement has increased in output and advanced in the steady use without a retrograde movement since that time, so has the South advanced in all lines of endeavor. Today Portland cement, principally in the form of reinforced concrete, is being most widely used throughout the South. The architects and engineers of that section have adopted it for all classes of structures, not only because of its fire-proof qualities, but because of its stability and adaptability for all kinds of structural work. Great quantities of structural steel are also being used in the modern building work in the South, especially for the large office buildings, hotels, public buildings, etc., as well as in the erection of industrial buildings of all kinds, where it cannot be surpassed for the many purposes for which it is particularly adaptable.

Marble, granites and other valuable building stones, of which the South possesses so many important deposits, are also being used in large and increasing quantities in the various structures being erected. The exteriors of a great many, both public and private, buildings are being faced with these materials, while the interiors are being decorated with them in a highly polished form, the whole giving beautiful examples of the architects' profession.

These facts, while general in character, tend to point out how increased prosperity in the South is bringing about the construction of the most modern types of buildings devoted to various purposes, and reflect the stability and firm foundation on which this prosperity must rest. But the work has just commenced, and with succeeding years, as the South continues to grow and prosper, as it will continue to do, this section will be found each year erecting increasing numbers of high-class structures to meet the demands of its people.

In order to outline and illustrate in a general way what has been accomplished during the past year in providing better buildings devoted to public and private business, the following brief summary is given and photographs of a number of structures completed or in the course of construction during the year are reproduced. This summary and the illustrations do not attempt to take in all of the work that has been done during 1909, but merely cites a few cases in order to outline the work that is being done, while a number of photographs of this work have been gathered together to produce at first hand evidences of the advancement being made:

Hotels.

San Carlos Hotel, Pensacola, Fla. Seven stories, 96x150 feet; reinforced concrete contruction throughout; cost $300,000; architect, Wm. Lee Stoddart, New York.

St. Anthony Hotel, San Antonio, Tex. Addition eight stories, 110x150 feet; reinforced concrete construction; cost $350,000; architect, J. Flood Walker, San Antonio, Tex.; contractors, Selden-Breck Construction Co., St. Louis, Mo.

Gunter Hotel, San Antonio, Tex. Eight stories; steel frame fireproof construction; cost $500,000.

Hermitage Hotel, Nashville, Tenn. Ten stories; steel frame fireproof construction; modern conveniences throughout; cost $650,000; architect, J. E. R. Carpenter, New York City.

Plaza Hotel, Port Arthur, Tex. Reinforced concrete construction; cost $125,000.

Bristol Hotel, Houston, Tex. Addition nine stories; reinforced concrete construction throughout; fireproof; 130 rooms.

Marion Hotel, Little Rock, Ark. Eight stories, 45x125 feet; fireproof construction; cost $100,000; architect, George R. Mann, Little Rock, Ark.

Hotel Lanier, Macon, Ga. One-hundred room addition and remodeling; cost $100,000.

Piedmont Hotel, Atlanta, Ga. Addition ten stories, 47x54 feet; fireproof construction; cost $200,000; architect, A. Ten Eyck Brown, Atlanta, Ga.

St. George Hotel, Dallas, Tex. Addition, eight stories; steel frame fireproof construction; cost $90,000; architect, H. P. Mozier.

H. M. Folkes, Biloxi, Miss. Hotel, three stories, 288 feet front; 150 rooms; modern equipment; cost $75,000; architects, Keenan & Weiss.

Tiller Estate, Fort Worth, Tex. Hotel, seven stories; reinforced concrete construction; cost, including equipment, $750,000; contractors, American Construction Co., Houston, Tex.

Seminole Hotel, Jacksonville, Fla. Ten stories; steel frame fireproof construction; 250 rooms; architect, H. J. Klucho, Jacksonville, Fla.

Lee Huckins Hotel & Office Building Co., Oklahoma City, Okla. Hotel, ten stories; steel frame fireproof construction; 443 rooms; cost $300,000; contractors, Selden-Breck Construction Co., St. Louis, Mo.

S. L. Matz, Bluefield, W. Va. Hotel, eight stories, 50x122 feet; fireproof construction; cost $125,000; architects, W. E. & E. L. Shufflebarger.

Muskogee, Okla. Hotel, ten stories, 75x120 feet; reinforced concrete construction; cost $300,000; architects, Ashby, Radford & Nieman, Muskogee, Okla.; contractors, Southern Construction Co., Muskogee, Okla.

Colonial Hotel, Knoxville, Tenn. Addition, four stories, 140x138 feet; cost, $100,000; architects, Okel & Cooper, Montgomery, Ala.

Office Buildings.

Judge Nathan Goff, Clarksburg, W. Va. Nine stories; steel frame construction; reinforced concrete floors; modern conveniences; cost $250,000; architects, Milburn, Heister & Co., Washington, D. C.

Realty Trust Co., Atlanta, Ga. Eight stories, 100x135 feet; reinforced concrete construction; cost $250,000; architect, A. Ten Eyck Brown, Atlanta, Ga.

Col. C. C. Gibbs, San Antonio, Tex. Nine stories, 42x135 feet; steel frame fireproof construction; reinforced concrete floors; modern equipment installed throughout; cost $400,000; architects, Sanguinet & Staats, Fort Worth, Tex.

Colcord Investment Co., Oklahoma City, Okla. Twelve stories; steel frame fireproof construction; cost $400,000; architects, Williams & Wells, Oklahoma City.

Max Herskowitz, Oklahoma City, Okla. Twelve stories; steel frame fireproof construction; cost $400,000; architects, E. Coady & Co., Oklahoma City; contractors, Gross Construction Co., Oklahoma City.

State National Bank, Oklahoma City, Okla. Twelve stories, 50x140 feet; steel frame fireproof construction; cost $300,000; contractors, Selden-Breck Construction Co., St. Louis, Mo.

American National Bank, Oklahoma City, Okla. Eight stories, 50x140 feet; reinforced concrete construction; modern equipment throughout; cost $175,000; architects, Layton, Smith & Hawk, Oklahoma City, Okla.

Wachovia National Bank, Winston-Salem, N. C. Seven stories; steel frame; reinforced concrete floors; modern conveniences; architects, Milburn, Heister & Co., Washington, D. C.

Southern Railway Co., Washington, D. C. Seven stories, 85x180 feet; fireproof construction; modern conveniences; cost $300,000; architects, Milburn, Heister & Co., Washington, D. C.

Third National Bank, Atlanta, Ga. Twelve stories, 50x140 feet; steel frame; reinforced concrete floors; exterior, buff Bedford stone; interior finish, quartered oak, Italian marble; modern equipment throughout; cost $350,000; architects, Mauran & Russell, St. Louis, Mo.

Central Bank & Trust Co., Memphis, Tenn. Eighteen stories; steel frame fireproof construction; cost $300,000.

Norfolk National Bank, Norfolk, Va. New banking structure; one story; stone exterior; cost $100,000.

People's Building & Investment Co., Charleston, S. C. Eight stories, steel frame fireproof construction; modern conveniences; cost $250,000; architects, Thompson & Frohling, New York.

First National Bank, Roanoke, Va. Seven stories; steel frame fireproof construction; metal doors and window frames throughout; first two stories, North Carolina granite; upper stories, gray pressed brick, with terra cotta cornice; banking room, on first floor, finished in bronze and marble; modern equipment throughout; cost, not including site, $225,000; architect, John K. Peebles.

Union Bank & Trust Co., Nashville, Tenn. Five stories, 45x89 feet; fireproof construction; cost $150,000; architects, Mowbray & Uffinger.

Audubon Building, New Orleans, La. Eight stories, 108x144 feet; steel frame fireproof construction; architects, Kennedy & Adkins, Cincinnati, O.

John G. Farley, Birmingham, Ala. Office building, nine stories, 50x100 feet; cost $200,000; architect, H. D. Breeding, Birmingham, Ala.

Fidelity & Deposit Co., Baltimore, Md. Fourteen-story addition, 108x125 feet; steel frame fireproof construction; cost $500,000; architects, Baldwin & Pennington, Baltimore.

Safe Deposit & Trust Co, Baltimore, Md. Addition, one story, 92 feet front; fireproof construction; cost $200,000; architects, Baldwin & Pennington, Baltimore.

Whitney Central Bank Building, New Orleans, La. Fourteen stories, 48x205 feet; steel frame construction, reinforced concrete floors; cost $1,000,000; architects, Clinton & Russell, New York, and Emile Weil, New Orleans, La.

State National Bank Building, Little Rock, Ark. Eleven stories, 60x140 feet; steel frame fireproof construction; cost $325,000; architect, George R. Mann, Little Rock, Ark.

South Texas National Bank, Houston, Tex. Three stories, 43x125 feet; cost $100,000; architect, C. D. Hill, Dallas, Tex.

H. Clay Grubb, Salisbury, N. C. Seven stories, 65x100 feet; steel frame fireproof construction; cost $125,000; architects, Rose & Western, Greensboro, N. C.

National City Bank, Charleston, W. Va. Eight stories, 22x82 feet; reinforced concrete construction; cost $50,000; architects, Mills & Pruitt, Columbus, Ohio.

Houston Building Co., Housfon, Tex. Sixteen stories, 102x103 feet; steel frame fire-proof construction; cost $600,000; architects, Sanguinet & Staats, Houston, Tex.; contractors, Wm. Miller & Sons Co., Pittsburg, Pa.

Citizens' Bank Building, Pine Bluff, Ark. Six stories, 50x160 feet; fireproof construction; cost $200,000.

E. N. Scarborough, Austin, Tex. Ten stories, 51x160 feet; steel frame fireproof construction; cost $250,000; architects, Sanguinet & Staats, Houston, Tex.

American National Bank, Richmond, Va. Addition, ten stories; steel frame fireproof construction; cost $175,000; architects, Wyatt & Nolting, Baltimore.

American National Bank, Austin, Tex. Eight stories; fireproof construction; cost $400,000; architects, C. H. Page & Bro., Austin, Tex.

Metropolitan Bank, New Orleans, La. Seven stories, 60x150 feet; fireproof construction; cost $200,000; architects, Diboll, Owen & Goldstein, New Orleans.

Watson Company, Fairmont, W. Va. Ten or fourteen stories, 70x100 feet; steel frame fireproof construction; cost $300,000; architect, Horace Trumbauer, Philadelphia, Pa.

Samuel Stephenson and Charles Alderson, Charleston, W. Va. Twelve stories, 40 x94 feet; steel frame fireproof construction, reinforced concrete floors; cost $150,000; architects, Harding & Upman, Washington, D. C.

Robson & Prichard, Huntington, W. Va. Ten stories, 40x160 feet; reinforced concrete construction; cost $150,000; architects, Elzner & Anderson, Cincinnati, Ohio.

City National Bank, Paducah, Ky. Ten stories; steel frame fireproof construction; cost $200,000; architect, W. L. Brainard, Paducah, Ky.

Public Buildings.

Municipal building and auditorium, Raleigh, N. C.; seating capacity 4500; cost about $100,000; architect, P. Thornton Mayre, Atlanta, Ga.

Auditorium, Houston, Tex., 150x250 feet; fireproof construction; seating capacity 7000; architects, Mauran & Russell, St. Louis, Mo.

Courthouse, Swisher county, Tex. Three stories, 76x104 feet; brick and stone exterior; fireproof construction; cost $60,000; architects, Withers & Elliott, Stamford, Tex.

Courthouse, Newton county, Miss. Two stories; fireproof construction; cost $40,000; architect, William S. Hull, Jackson, Miss.

Courthouse, Hemphill county, Tex. Three stories; brick and stone construction; cost $40,000; architects, C. H. Page, Jr., & Bros., Austin, Tex.

Courthouse, Giles county, Tenn. Two stories, 70x120 feet; brick and stone exterior; fireproof construction; cost $130,000; architect, Benj. B. Smith, Montgomery, Ala.

Courthouse, Roanoke county, Va. Three stories, 61x111 feet; brick and stone exterior; fireproof construction; cost $50,000; architect, H. H. Huggins, Roanoke, Va.

Courthouse, Lincoln county, Ky. Three stories and basement, 100x150 feet; brick and stone exterior; cost $40,000; architects, Milburn, Heister & Co., Washington, D. C.

Courthouse, Jefferson county, Fla. Brick and stone exterior; fireproof construction; cost $40,000; architects, E. C. Hosford & Co., Eastman, Ga.

Courthouse, Ben Hill county, Ga. Two stories; brick and stone exterior; fireproof construction; cost $50,000; architect, H. H. Huggins, Roanoke, Va.

Courthouse and Jail, Hidalgo county, Tex. Two stories, brick and stone exterior; fireproof construction; cost $90,000; architects, Phelps & Ayers, San Antonio, Tex.

Courthouse, Gaston county, N. C. Three stories; brick and stone exterior; fireproof construction; cost $75,000; architects, Milburn, Heister & Co., Washington, D. C.

Courthouse, Roby, Tex. Stone exterior; fireproof construction; cost $65,000.

Courthouse, Preston county, W. Va. Three stories; brick and stone exterior; cost $150,000; architects, Milburn, Heister & Co., Washington, D. C.

Cotton Mills.

Brandon Mills, Greenville, S. C. Addition, four stories, 125x300 feet, making the main building 125x657 feet; slow-burning construction; equipment, 80,000 spindles, 2000 Draper looms; electrically driven, with steam as auxiliary power; approximate cost $1,400,000; engineers, Lockwood, Greene & Co., Boston, Mass.

Waverly Cotton Mill, Laurinburg, N. C. One-story building, 125x425 feet; equipment, 18,000 spindles; architect, R. C. Bibberstein.

Manchester Cotton Mills, Manchester, Ga. Main building, three stories, 100x450 feet; slow-burning construction; installation, 20,000 spindles, 500 looms; 750-horse-power plant; engineer, A. F. Walker, Atlanta, Ga.

Unity Cotton Mills, Lagrange, Ga. Additional mill, 132x290 feet; slow-burning construction; installation, 10,000 spindles; machinery electrically driven, 500-horse-power being required; cost $450,000; engineer, Park A. Dallis, Atlanta, Ga.

Dan River Power & Manufacturing Co., Danville, Va. Additional mill, three stories, 150x550 feet; installation, 50,000 spindles, 1500 looms; operated by electric power furnished by water-power plant; cost $1,000,000; engineers, Lockwood, Greene & Co., Boston, Mass.

Locke Cotton Mills Co., Concord, N. C. Additional mill; one-story building, 125x 545 feet; slow-burning construction; initial installation, 12,000 spindles; cost $1,000,000; architects, Frank P. Sheldon & Son, Providence, R. I.

Erwin Cotton Mills Co., West Durham, N. C. Additional mill; spinning department, 518x200 feet; weaving department, 307x303 feet; picker-house, 87x92 feet; plant occupies nearly five acres of land; installation, 50,000 spindles, 1500 looms; electrically driven, 3000 horse-power being required; cost $1,000,000; engineers, Frank P. Sheldon & Son, Providence, R. I.

Woodside Cotton Mills, Greenville, S. C. Additional mill; main building, four stories, 130x280 feet; cotton storehouse; church, mechanical building and seventy-five cottages for employes to be erected; installation, 25,000 spindles, 650 looms; cost $500,000; engineer, Joseph E. Sirrine, Greenville, S. C.

Eureka Cotton Mills, Chester, S. C. Additional mill buildings, 483x82 and 128x260 feet; installation, 10,000 spindles, 450 looms; electrically driven; engineer, O. A. Robbins, Charlotte, N. C.

Albany Cotton Mills, Albany, Ga. Main building, four stories, 135x185 feet; cotton warehouse, 100x150 feet; 340-horse-power plant; sixty operatives' cottages; installation, 10,800 spindles, 280 looms; engineers, Lockwood, Greene & Co., Boston, Massachusetts.

Columbus Manufacturing Co., Columbus, Ga. Additional mill, four stories, 275 feet long; installation, 20,000 spindles, 600 looms; cost of building and machinery, $500,000; engineers, Lockwood, Greene & Co., Boston, Mass.

Arcadia Mills, Arcadia, S. C. Additional mill, 105x255 feet; installation, 10,000 spindles, 250 looms; engineer, J. E. Sirrine, Greenville, S. C.

Newberry Cotton Mill, Newberry, S. C. Additional mill, four stories, 80x180 feet; installation, 10,000 spindles, 300 looms; electrically driven; cost $250,000; engineers, Lockwood, Greene & Co., Boston, Mass.

Marion Manufacturing Co., Marion, N. C. Main building, four stories, 132x215 feet; warehouse, 100x100 feet; installation, 12,500 spindles, 300 looms.

Calhoun Mills, Calhoun Falls, S. C. Additional mill; installation, 10,000 spindles, 200 looms; cost $200,000.

Patterson Mills Co., Roanoke Rapids, N. C. Main building, two stories, 105x568 feet; 90 operatives' cottages; 6 overseers' dwellings; installation, 22,000 spindles, 750 looms; electrically driven; 1000 horse-power; engineers, Lockwood, Greene & Co., Boston, Mass.

Entwistle Manufacturing Co., Rockingham, N. C. Installation, 40,000 spindles, 1000 looms; cost $1,000,000; engineer, Stuart W. Cramer, Charlotte, N. C.

Republic Cotton Mills, Great Falls, S. C. Two-story building, 132x635 feet; installation, 25,000 spindles, 1000 looms; complete mill town, including water-works, sewerage system, electric-lighting system, schools, churches, etc.; cost $600,000; engineer, J. E. Sirrine, Greenville, S. C.

Railway Structures.

Virginian Railway Co. Coal pier at Sewells Point, Norfolk, Va., 1000 feet long, 65 feet wide; steel superstructure on concrete foundation; specially designed equipment; dumping capacity, 1500 tons an hour, or 4,500,000 tons a year.

Baltimore & Ohio Railroad Co., Baltimore, Md. New produce yards and warehouse buildings, two stories, 45x275 feet; cost $350,000.

Seaboard Air Line, Wilmington, N. C. Three-story warehouse, terminals and improvements; cost $250,000.

Kansas City Southern Railroad, Kansas City, Mo. Warehouse and improvement of dock facilities at Port Arthur, Tex.; cost $350,000.

Central of Georgia Railway Co., Macon, Ga. Erection of shops at Macon, Ga.; estimated cost of improvements, $1,500,000.

Clyde Steamship Co., New York City. New terminals at Jacksonville, Fla.; three piers 350 feet long, 140 feet wide; cost of improvements $750,000.

Pennsylvania Railroad. New Union Station at Baltimore, Md.; cost, exclusive of foundation, $500,000.

Texas City Company, Texas City, Tex. One of the most modern railroad and steamship terminals in the country; ultimate cost $3,000,000; nine warehouses and covered car sheds; daily total covered floor space, 615,110 square feet; elevator capacity, 500,000 bushels; storage tanks capacity, 500,000 bushels.

New Orleans & Northeastern Railroad. Passenger station, Hattiesburg, Miss. Building, 36x215 feet; train shed, 1000 feet long; express building, 36x75 feet; cost about $100,000; architects, Milburn, Heister & Co., Washington, D. C.

New Orleans Great Northern Railroad. Large shops at Bogalusa, La.; plant includes five main buildings and seven auxiliary buildings; buildings have walls of reinforced concrete construction; shops are modern in every particular and contain all equipment necessary for repairing and rebuilding work.

Norfolk & Southern Railway, Norfolk, Va. Office building, five stories, 53x120 feet; steel frame fireproof construction; also warehouse, one story, 321x274 feet; cost of both, $125,000; architect, B. F. Mitchell, Norfolk, Va.

Carolina, Clinchfield & Ohio Railway. Car shops at Erwin, Tenn., including locomotive shop, power-house and roundhouse, $105,000; tool and shop equipment, $86,000; coaling station and yard tracks, $100,000.

Mississippi Central Railway, Natchez, Miss. New passenger and freight station; fireproof construction; cost $50,000; architect, Milburn, Heister & Co., Washington, D. C.

Houston Belt & Terminal Co., Houston, Tex. New union station, three stories, 130x250 feet; steel frame fireproof construction; cost $600,000; architects, Warren & Wetmore, New York; other improvements also being made, making entire cost $1,000,000.

Baltimore & Ohio Railroad. Enlarging shops at Benwood, W. Va., at cost of $150,000.

International & Great Northern Railroad. Constructing terminal facilities at Taylor, Tex.; cost of buildings and other improvements, $100,000.

Kansas City Southern Railway. Constructing shops at Shreveport, La.; cost, $350,000.

Norfolk & Western Railway. New passenger station, Petersburg, Va., 41x166; fireproof construction.

Missouri, Kansas & Texas Railway. New union station, Denison, Tex., two and a half stories, 90x260 feet; fireproof construction; cost, $175,000.

Gulf, Colorado & Santa Fe Railway. Passenger station, Temple, Tex. Two stories, 45x264; also train sheds; cost, $100,000.

Texas & Pacific Railway. Passenger station, Sherman, Tex., one story, 60x150 feet; cost, $40,000.

Atchison, Topeka & Santa Fe Railway, Amarillo, Tex. Freight-house, 40x400 feet; hotel and depot, 50x180 feet; cost, $100,000.

Iron and Steel Plants.

Southern Iron & Steel Co., Gadsden, Ala. New wire, rod and nail mill, being erected; also, building two open-hearth steel furnaces; to employ about 3500 hands.

Tennessee Coal, Iron & Railroad Co., Ensley, Ala. Rebuilding of furnaces, enlargement of steel plant, building of by-product coke ovens, to produce 3000 tons of coke a day, a storage reservoir to hold 2,500,000,000 gallons of water, etc.; all involving a recent and prospective outlay of about $12,000,000 to $13,000,000.

American Steel & Wire Co. New wire and rod plant at Birmingham, Ala.; cost to be about $3,000,000; daily capacity, 400 tons.

Phillips Sheet & Tin Plate Co., Clarksburg, W. Va. New sheet and tin plate mill, to have capacity of 25,000 tons; cost, $1,000,000.

Virginia Bridge & Iron Co., Roanoke, Va. New structural iron plants at Atlanta, Ga., and Memphis, Tenn. Atlanta (Ga.) plant, 200x245 feet; modern equipment throughout; output, 300 tons monthly of fabricated material, besides an additional tonnage of plain beams and similar material. Memphis (Tenn.) plant—Main shop buildings, 666 feet long; modern equipment throughout; all machinery equipment with individual motor drive; capacity, 1500 tons structural steel per month; cost $200,000. At its main plant, in Roanoke, this company is about doubling its present capacity; erecting new fireproof structure of structural steel, giving it a capacity of 5000 tons of finished product per month; cost of these improvements, $150,000.

Maryland Steel Co., Sparrows Point, Md. New open hearth steel plant; main building, 150x490 feet; gas-producer building, 30x300 feet; 250 tons capacity; cost, $1,000,000; also installing new ore-handling equipment costing $250,000.

Independent Steel Co., Kenova, W. Va. Incorporated with capital stock of $2,000,000. To establish plant; contracts awarded for buildings, including main structure, 120x605 feet, and eight other structures, the smallest being 60x70 feet.

Wheeling Mold & Foundry Co., Wheeling, W. Va. 25-ton steel-casting furnace, with brass-cutting machinery, costing $60,000 to $80,000.

De Soto Foundry & Machine Co., Mansfield, La. Plant for manufacturing steel by Tropenas process; building, 60x120 feet; cost of plant, $40,000.

Penn Iron & Steel Co., Penn City, Tex.; incorporated with capital of $500,000. To build a plant for manufacturing cotton ties, etc.; erecting main building, 400x1600 feet.

North Alabama Rolling Mill Co., Sheffield, Ala.; incorporated with capital stock of $150,000. Purchased and remodeling plant of Sheffield Rolling Mill Co.; cost of improvements, $75,000.

Sheffield Coal & Iron Co., Sheffield, Ala. Remodeling plant to provide larger output.

Bessemer Rolling Mill, Bessemer, Ala. Addition to its rolling mill; cost, $75,000.

Southwestern Iron & Steel Structural Co., Oklahoma City, Okla. Foundry and machine shop for manufacturing flat-iron, windmills and structural iron and steel work; annual capacity, 1000 tons and 6000 windmills; cost of improvements, $80,000.

Lumber and Woodworking Plants.

The Hebard Cypress Co., Philadelphia, Pa. New reinforced concrete plant at Waycross, Ga.; reinforced concrete construction throughout; buildings include main mill, two and three stories, 64x192 feet; sorting shed, one story, 64x146 feet; lath and shingle mill, 70x92½ feet; fuel house, 30x60 feet; capacity, 150,000 feet of lumber daily; cost $500,000; engineer, Daniel B. Banks, Baltimore, Md.; contractors, David E. Evans & Co., Baltimore, Md.

J. J. Newman Lumber Co. New plant at Hattiesburg, Miss., replacing burned one; steel and concrete construction throughout; capacity, 250,000 feet daily.

Aripeka Sawmills. Enlargement at its plant at Fivay, Fla.; two additional mills to be completed at a cost of $500,000, making the value of the entire plant at this place $1,500,000.

Gulf Lumber Co., St. Louis, Mo. Addition to its plant at Fullerton, La.; new building, 64x288 feet; all steel construction; capacity 400,000 feet daily, which, in addition to the timber mill finished in 1908, with a capacity of 400,000 feet daily, makes this plant one of the largest in the South; the total investment represents about $1,500,000.

Avoyelles Cypress Co., Cottonwood, La. Establishing a new plant; daily capacity 50,000 feet cypress lumber, 50,000 shingles, 30,000 laths; steel mill building, 36x150 feet.

F. B. Williams Cypress Co., Patterson, La. Rebuilding plant, to increase daily output of 150,000 feet of lumber; cost of improvements, $100,000.

Whiting Manufacturing Co., Judson, N. C. New lumber plant; main building, 80x160 feet; three fireproof brick and concrete kilns; storage shed, 125x350 feet.

Surry Lumber Co., Norfolk, Va. New planing mill, with daily capacity of 200,000 feet.

Sewell Lumber Co., Sewell, W. Va. New band mill, with daily capacity of 50,000 feet; kilns for drying entire output; circular-saw mill for timbers up to 60 feet long; new logging railway; annual output of plant, 15,000,000 feet of lumber; cost of improvements, $250,000.

Escambia Land & Manufacturing Co., Pensacola, Fla. Building new sawmill in Floridatown; daily capacity 75,000 feet; building, 56x200 feet.

Thompson & Tucker Lumber Co., Willard, Tex. New saw and planing mill and auxiliary buildings; daily capacity 125,000 feet; cost of buildings, $200,000.

Raleigh Lumber Co., Berkeley, W. Va. New plant at Fitzpatrick, W. Va.; capacity 60,000 feet daily hardwood, white pine and hemlock; cost of improvements, $75,000.

Chaffey & Wilson Lumber Co., Elkins, W. Va. Constructing railway and building sawmill, with daily output of 100,000 feet, for developing 17,000 acres timberland in Pocahontas county.

Day Lumber Co., New Orleans, La. Purchased 12,000 acres timber land in Jefferson county, Miss., for $165,000 and constructing mill with daily output of 100,000 feet lumber; cost of improvements, $125,000.

Honaker Lumber Co., Honaker, Va. Constructing new buildings, including double band-saw mill and planing mill, machine shop, drykiln and a number of dwellings; cost of improvements, $100,000.

Richland Lumber Co., Rayville, La. Building hardwood mill for developing 13,000 acres timber land; buildings of steel construction on concrete foundation; total investment, $200,000.

Thompson Bros. Lumber Co., Houston, Tex. Increased capital stock from $600,000 to $2,100,000, and will erect mill in Trinity county with daily capacity of 100,000 feet and costing $300,000.

Chalmette Cypress Co., New Orleans, La. New plant with annual capacity of 16,000,000 feet; cost of improvements, $150,000.

Wyatt Lumber Co., Wyatt, La. Will establish a plant in Sabine parish, to develop

24,000 acres timber land; plant to have capacity of 50,000 to 60,000 feet daily; drykiln and planing mill also to be constructed: expenditure, $150,000.

Miller Manufacturing Co., Richmond, Va.; incorporated, $300,000 capital stock. Erecting plant at Manchester, Va., including three-story box mill, 75x330 feet; three-story millwork building, 75x330 feet; one story power plant, 42x120 feet; three-story office, 40x50 feet; drykiln, daily capacity 50,000 feet; cost of buildings, $75,000.

National Casket Co., Oneida, N. Y. New plant on French Broad River, N. C.; main building, 280x180 feet; reinforced concrete construction; cost $125,000.

Virginia Manufacturing Co., Suffolk, Va. Plant to manufacture fruit and vegetable packages; main building, 80x184 feet, with side extension, 56x112 feet; cost $20,000; daily capacity, 100,000 berry baskets, 75,000 to 100,000 butter dishes, and other small packages.

Standard Box Co., Baton Rouge, La. Addition, two stories, 76x140 feet, cost $12,500; planing mill and box machinery, cost $36,000; ultimate capacity, two cars daily.

Oil Refineries.

Standard Oil Co. has acquired over 200 acres on the river front at Baton Rouge, La., and is establishing $2,000,000 refinery and will build large terminal facilities and pipe line extending into the oil field; ultimate cost of all improvements to be, approximately, $5,000,000.

Gulf Refining Co. Additions to its large plant at Port Arthur, Tex. This plant covers 500 acres of land and the refinery has a monthly capacity of 500,000 barrels of crude oil. This is the largest independent refinery in the world.

Texas City Refining Co., Texas City, Tex. Increased capital stock from $150,000 to $300,000 for enlarging plant from 2000 to 4000 barrels of oil daily; cooperage plant and additional tankage will also be constructed. This company is planning expenditure of $2,000,000 within the next two years for enlarging its facilities.

Portland Cement Plants.

Oklahoma City Portland Cement Co.; incorporated with capital stock of $1,200,000. To establish a 2400-barrel daily capacity Portland cement plant at Hartshorne, Okla.; steel and concrete buildings; steam turbines for generating power; modern equipment throughout.

Norfolk Portland Cement Corporation; incorporated with capital stock of $850,000. To build 2500-barrel daily capacity plant at Norfolk, Va.; buildings of steel construction and including main building, 225x650 feet; cost $150,000; cost of machinery and equipment, $500,000.

Atlantic & Gulf Portland Cement Co., Ragland, Ala. Establishing Portland cement plant with initial daily capacity of 2000 barrels, later to be increased to 3000 barrels; cost of improvements, $1,000,000.

Jamestown Portland Cement Corporation; incorporated; capital stock of $1,040,000. To build plant with daily output of 4000 barrels near Newport News, Va.; cost of plant, $1,000,000.

Security Cement & Lime Co., Security, Md. Increasing capacity of Portland cement plant from 800 to 2500 barrels daily; also developing large limestone quarry and establishing lime plant near Martinsburg, W. Va.

The Standard Portland Cement Co., Leeds, Ala. Capacity of plant increased.

Miscellaneous.

West Virginia Pulp & Paper Co., Covington, Va. Enlargement of plant; new buildings include three structures, 75x180 feet; one structure, 75x230 feet; all of these 50 feet high, of brick, steel and concrete construction; cost $500,000; also completed during the year, brick, steel and concrete building 60 feet square and 50 feet high, in which were installed two wedge mechanical seven-hearth furnaces, 21 feet in diameter and 26 feet high, to burn the sulphur out of Virginia pyrites and having a daily capacity of 50 tons; the cost of this improvement, $35,000.

Clinchfield Coal Corporation, Dante, Va. New development work in connection with enlarging the company's output of 1,000,000 tons annually until an output of 5,000,000 tons is reached. This company has 300,000 acres of coal land in Southwest Virginia and has planned and is carrying to completion one of the broadest and most comprehensive coal-mining plants in the country.

Harbison-Walker Refractories Co., Pittsburg, Pa. New fire-brick plant at Wylam, Alabama.

Southern Wood Distillates & Fiber Co., Bogalusa, La. Large plants to manufacture wrapping paper, fiber board, etc., from waste of Great Southern Lumber Co.'s plant; buildings and equipment to cost $300,000.

Columbia Cotton Oil & Provision Co., Washington, D. C. New plant completed at a cost of $450,000; facilities provide for killing 4000 hogs weekly, and in connection a cotton oil plant with 1000-barrel capacity is operated to produce lard compounds.

Morris Fertilizer Co., Atlanta, Ga. Large fertilizer factory; main building, 171x392 feet; capacity of plant, 35,000 to 45,000 tons; cost $125,000.

B. F. Avery & Sons, Louisville, Ky. New plow and implement plant; plant comprises eleven buildings, all having concrete foundations, brick walls and practically fireproof construction; engineer, George M. Brill, Chicago; contractors, Westlake Construction Co., St. Louis, Mo.

Oklahoma Publishing Co., Oklahoma City, Okla. Printing plant and office building, five stories, 50x140 feet; reinforced concrete construction; cost of building, $140,000; cost of equipment, $80,000; contractors, Westlake Construction Co., St. Louis, Missouri.

Tennessee Packing & Stock Yards Co., Nashville, Tenn., incorporated with $2,000,000 capital stock. Will expend $100,000 for improvements to enlarge plant.

Wells-Sapulpa Packing Co., Sapulpa, Okla. Packing plant; capacity, 400 cattle and 600 hogs daily; cost of plant, $260,000.

El Reno Packing & Provision Co., El Reno, Tex., incorporated with capital stock of $500,000. Will expend $150,000 for plant with daily capacity of 1000 hogs and 200 cattle; fertilizer plant, glue factory and oil refinery will also be constructed.

Armour & Co., Chicago, Ill. Cold-storage plant at Birmingham, Ala., five stories, 50x157 feet; cost $125,000.

Alabama Fire-Brick Manufacturing Co., Riverside, Ala., incorporated with $50,000 capital stock. Erecting plant of daily capacity of 100,000 fire-brick.

West Kentucky Coal Co. Opening two mines near Wheatcroft, Ky., with capacity of 5000 tons daily; other mines will be opened until capacity of 10,000 tons is reached.

Big Vein Pocahontas Coal Co., Baltimore Md., incorporated; capital stock of $300,000. To develop coal mines in Pocahontas field; new equipment will be installed to increase daily output to 200,000 tons; new electrical equipment, boiler-house, machine shops and blacksmith shops.

Consolidation Coal Co., Baltimore, Md. Developing 30,000 acres of coal land in Millers Creek field, Kentucky; $3,000,000 to be expended for facilities, including mining town, plant, electric-power installations, steam railway, etc.; annual production, 1,000,000 tons.

Portsmouth Cotton Oil Refining Corporation, Portsmouth, Va. Addition for manufacturing soaps and by-products of cotton oil; three stories, 50x130 feet; storage capacity, 1500 barrels; cost $35,000; refrigerating plant also to be established; total cost of improvements, $50,000.

Mound Bayou Oil Mill & Manufacturing Co., Mound Bayou, Miss., incorporated; capital stock, $100,000. Building cotton oil mill, 60x220 feet, and storage warehouse, 50x380 feet; daily capacity, 80 tons.

Farmers & Ginners' Cotton Oil Co., Austin, Tex., incorporated; capital stock of $80,000. Constructing mill building, two stories, 90x124 feet.

Tulsa Cottonseed Oil Mill, Tulsa, Okla. Erecting new plant, consisting of three buildings, 60x250 feet, 30x80 feet and 60x160 feet; capacity, 80 tons; installing machinery at cost of $40,000; cost of plant, $80,000.

Greenesville Water Power Co., Emporia, Va. Constructing hydro-electric plant; cost, including machinery, $100,000.

Fredericksburg Electric Co., Fredericksburg, Va. Constructing electric-light and power plant; reinforced concrete building, 42x62 feet; capacity, 16,500 horse-power; cost of building and equipment, $200,000.

Richmond, Va., constructing municipal electric-light plant, at cost of $200,000.

El Paso Electric Railway Co., El Paso, Tex. Enlarging power-house, 330x360 feet.

Twin City Power Co. Constructing water-power electric plant in South Carolina; initial development, 26,000 horse-power; final development, 46,000 horse-power; total cost, $4,000,000.

Model Mill Co., Johnson City, Tenn. Erecting flour and meal mill, two stories, 42x120 feet; cost of building, $20,000; cost of equipment, $15,000; capacity of plant, 400 barrels flour and 2000 barrels meal daily.

Fuller Combing Gin Co., Rossville, Ga. Erecting large plant to manufacture cotton gins; main building, two stories, 60x260 feet; reinforced concrete construction; cost $30,000.

Cotton Growers' Industrial Co., New Decatur, Ala. Erecting plant to manufacture agricultural implements; cost of buildings and equipment, $60,000; daily capacity, 50 farm implements.

Emerson Engine Co., Alexandria, Va., incorporated; $100,000 capital stock. To manufacture engines using gasoline and producer gas in sizes of 10 to 10,000 horse-power; capacity of plant, 40 engines weekly.

Oklahoma Iron Works, Tulsa, Okla. New foundry building, 80x160 feet; structural iron shop, 100 by 200 feet; cost $35,000.

Merchants' Ice & Cold Storge Co., Houston, Tex., incorporated with $30,000 capital stock, and erecting six-story reinforced concrete building.

Merchants' Ice & Cold Storage Co., San Antonio, Tex. New plant; main building, four stories, 50x117 feet; engine, boiler and machinery house, 42x117; cost $100,000.

Davison Chemical Co., Baltimore, Md. Building new sulphuric acid plant; buildings include steel-frame structures 200x300 feet, 100x200 feet, and other smaller buildings; 350-foot pier of timber and steel construction, equipped with unloading equipment; capacity of plant, 100,000 tons sulphuric acid annually; cost $700,000.

Yellow Pine Paper Co., Orange, Tex. Increasing capacity of present plant from 10 to 30 tons daily; cost of improvements, $200,000.

South Cotton Stalk Pulp & Paper Co., Cordele, Ga. Erecting plant to manufacture paper and cotton stalk; capacity, 40 tons daily.

Blair Limestone Co., Martinsburg, W. Va. Increasing capacity of plant; cost of improvements, $300,000.

Lee County Packing Co., Fort Myers, Fla. Packing plant, two stories, 132x200 feet; cost $30,000; machinery cost, $10,000.

Morris & Co., Chicago, Ill. Large packing plant and auxiliary buildings at Oklahoma City, Okla., to cost $500,000.

Winding Gulf Colliery Co., Cincinnati, Ohio. Developing coal mines near Abney, W. Va., to have output of 500,000 tons annually.

Edgemont Coal Co. Developing coal mines near Pineville, Ky., at a cost of $500,000.

Chesapeake & Ohio Coal & Coke Co., New York. Opening new mines near Harpers, W. Va., expending $500,000 for initial plant.

Big Coal Co., Pittsburg, Pa. Authorized expenditure $600,000 for new operations increasing output from 500,000 tons to 1,000,000 tons annually.

Four States Coal & Coke Co.; new company, with capital stock of $5,000,000. Will expend $1,500,000 for initial development near Fairmont, W. Va.; to have annual output of 1,000,000 tons annually.

Southern States Cotton Oil Refining Co., Wilmington, N. C., incorporated, with capital stock of $1,500,000. Building mill costing $40,000 at Whitekers, N. C.; also 800-barrel refinery at Wilmington, and will later erect plants at other points.

Elba Manufacturing Co., Charlotte, N. C. Erecting new cottonseed oil plant at Maxton, N. C.; main building, two stories, 55x105 feet; two seedhouses, 60x160 feet; boiler-rooms, oil tanks, etc.; complete plant for manufacture and storage of cottonseed oil and cottonseed fertilizer; 600-horse-power steam plant; cost, $150,000.

Carolina-Tennessee Power Co.; increased capital stock $5,000,000 and building 30,000-horse-power hydro-electric plant on Hiawassee River, Tenn.; cost of plant, $4,000,000.

Richmond Locomotive Co., Richmond, Va. Additions and enlargement of plant at a cost of $1,000,000.

Tennessee Packing & Stock Yards Co., Nashville, Tenn. Erecting ice and cold-storage plant, six stories; reinforced concrete construction; 90x200 feet; capacity of ice plant, 400 tons daily; cost of building, $150,000.

STATE NATIONAL BANK BUILDING, OKLAHOMA CITY, OKLA.

AMERICAN NATIONAL BANK BUILDING, OKLAHOMA CITY, OKLA.

PEOPLE'S NATIONAL BANK BUILDING, CHARLESTON, S. C.

MAX HERSKOWITZ OFFICE BUILDING, OKLAHOMA CITY, OKLA.

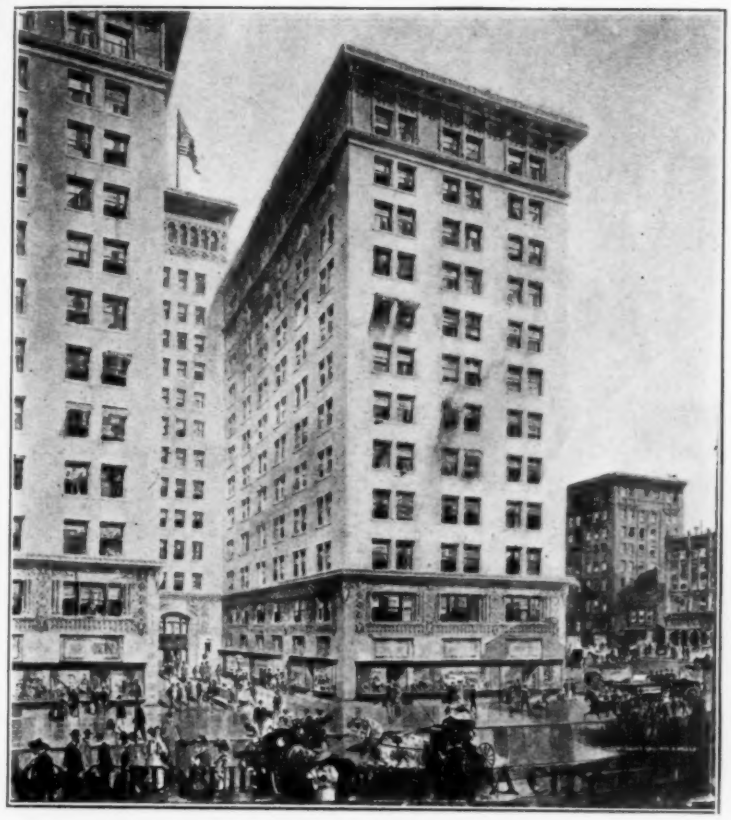
WACHOVIA NATIONAL BANK BUILDING, WINSTON-SALEM, N. C.

CHARLOTTE TRUST CO. BUILDING, CHARLOTTE, N. C.

THIRD NATIONAL BANK BUILDING, ATLANTA, GA.

CENTRAL BANK & TRUST CO. BUILDING, MEMPHIS, TENN.

FORSYTH THEATER AND OFFICE BUILDING, ATLANTA, GA.



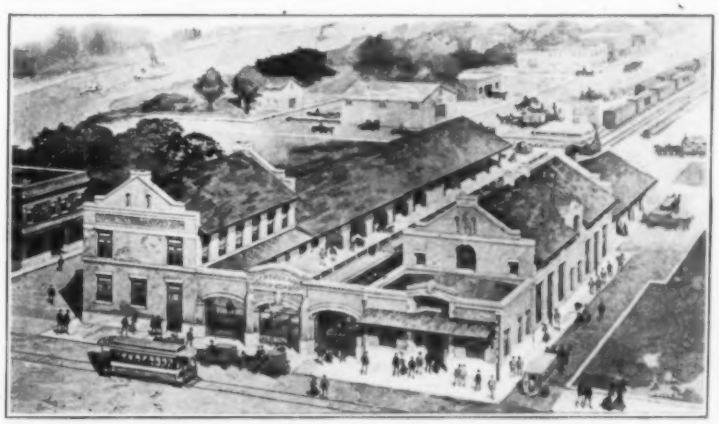
COLCORD BUILDING, OKLAHOMA CITY, OKLA.

FIRST NATIONAL BANK BUILDING, ROANOKE, VA.

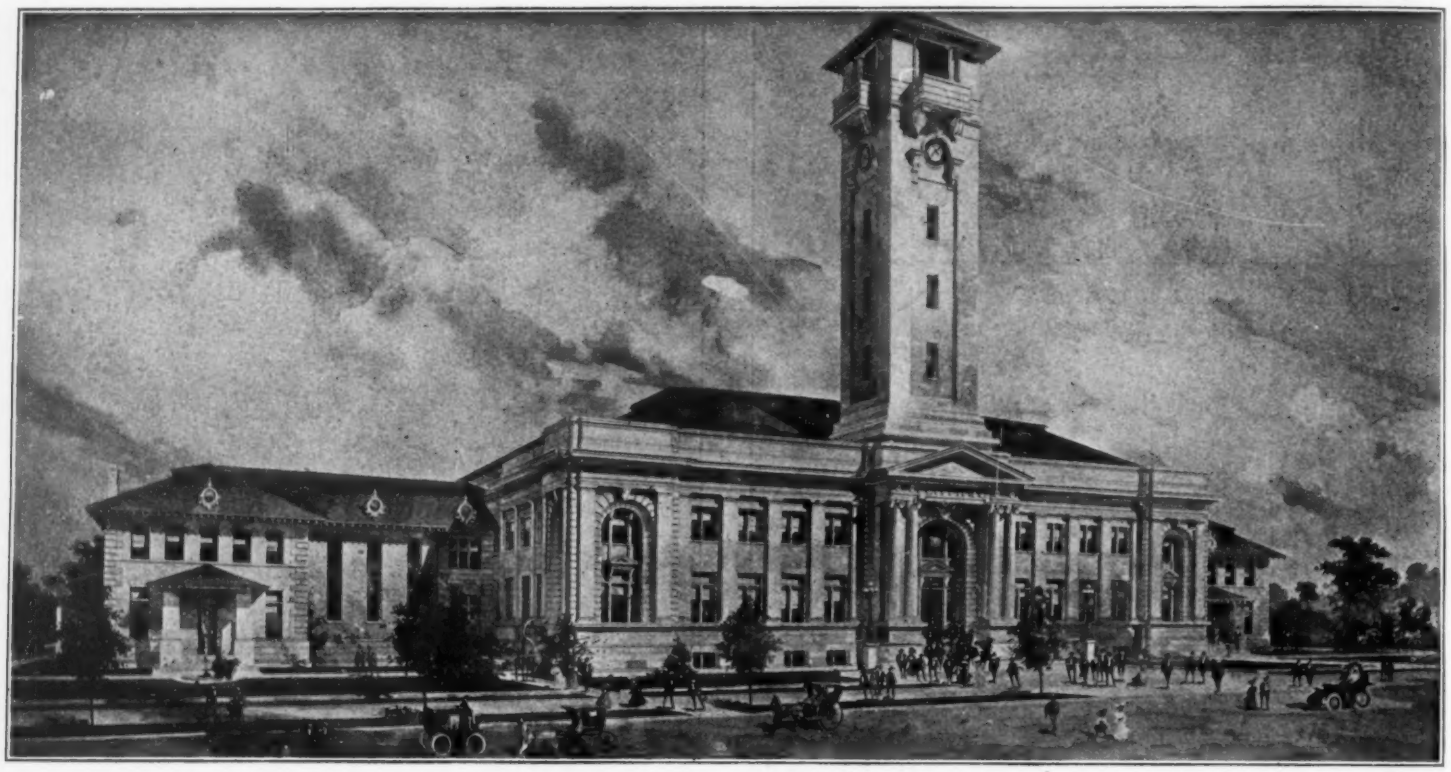
GIBBS BUILDING, SAN ANTONIO, TEX.

GOFF BUILDING, CLARKSBURG, W. VA.

BRANDON MILLS, GREENVILLE, S. C.



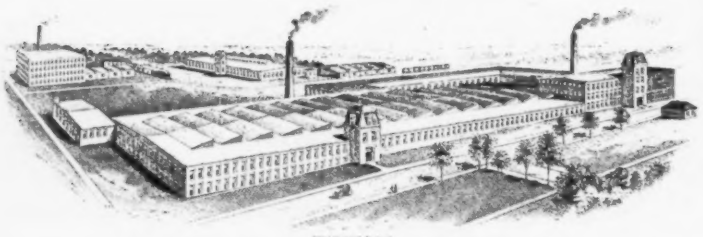
MISSISSIPPI CENTRAL TERMINAL, NATCHEZ, MISS.



MUNICIPAL BUILDING, MONROE, LA.

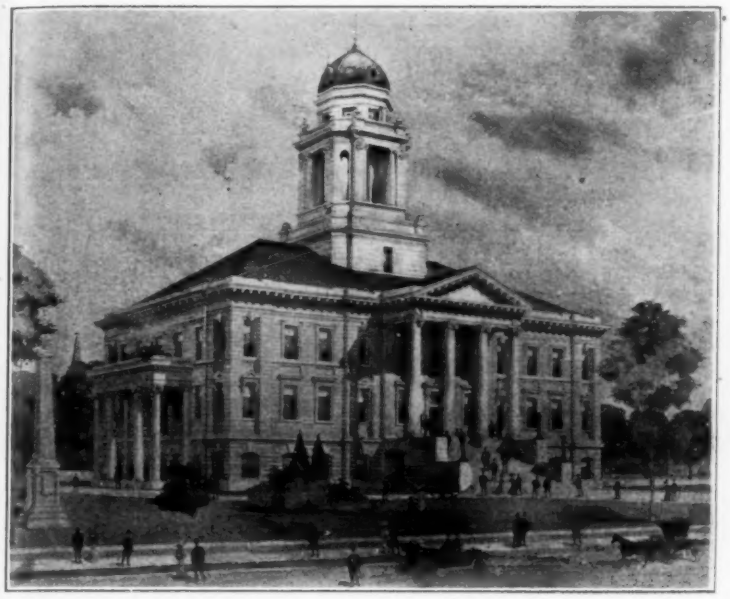
SAN CARLOS HOTEL, PENSACOLA, FLA.

HOTEL ST. ANTHONY, SAN ANTONIO, TEX.



LOCKE COTTON MILLS, CONCORD, N. C.

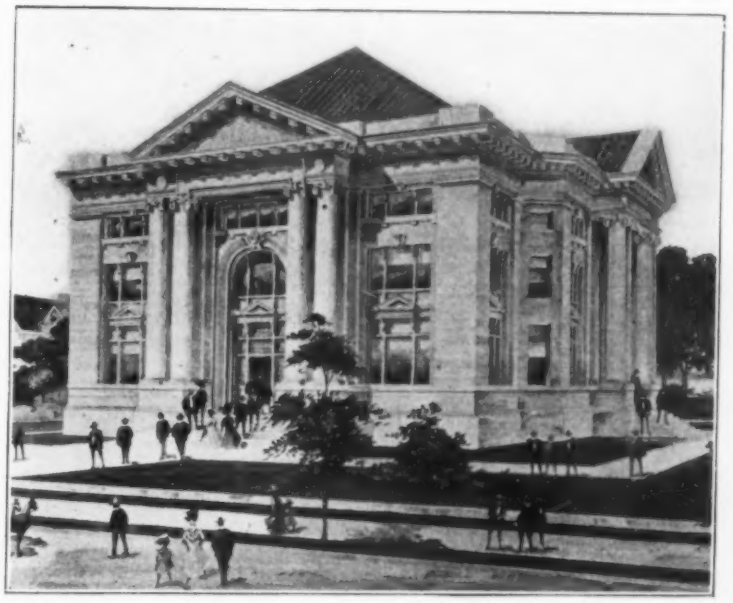
GUNTER HOTEL, SAN ANTONIO, TEX.



PRESTON COUNTY COURTHOUSE, KINGWOOD, W. VA.

ROBESON COUNTY COURTHOUSE, LUMBERTON, N. C.

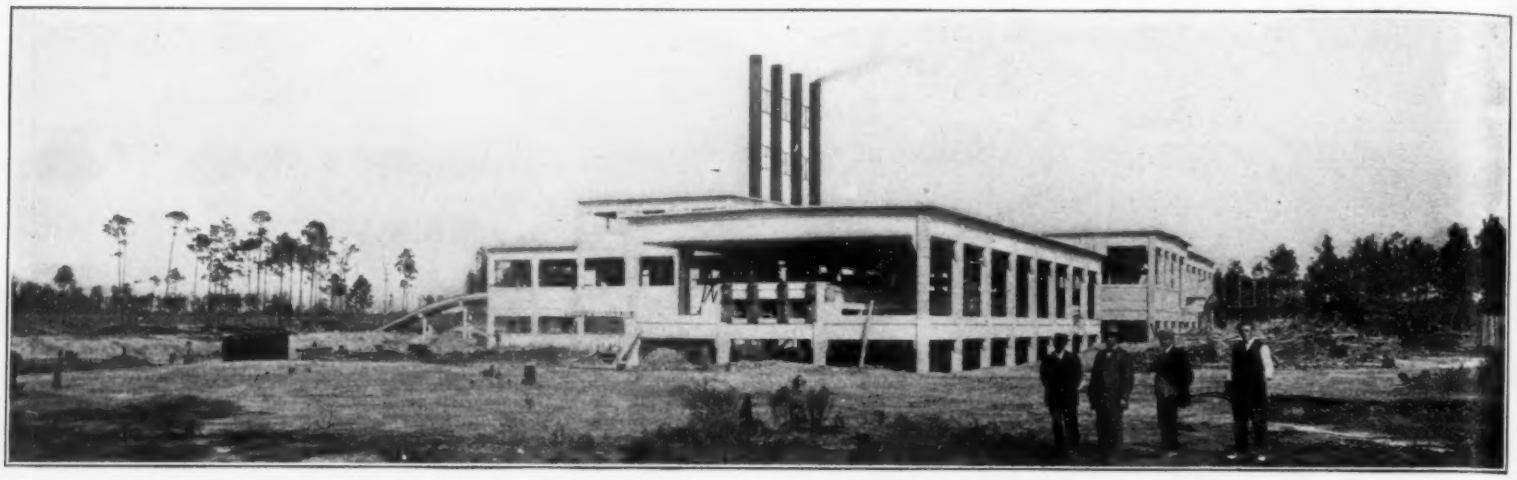
VANCE COUNTY COURTHOUSE, HENDERSON, N. C.



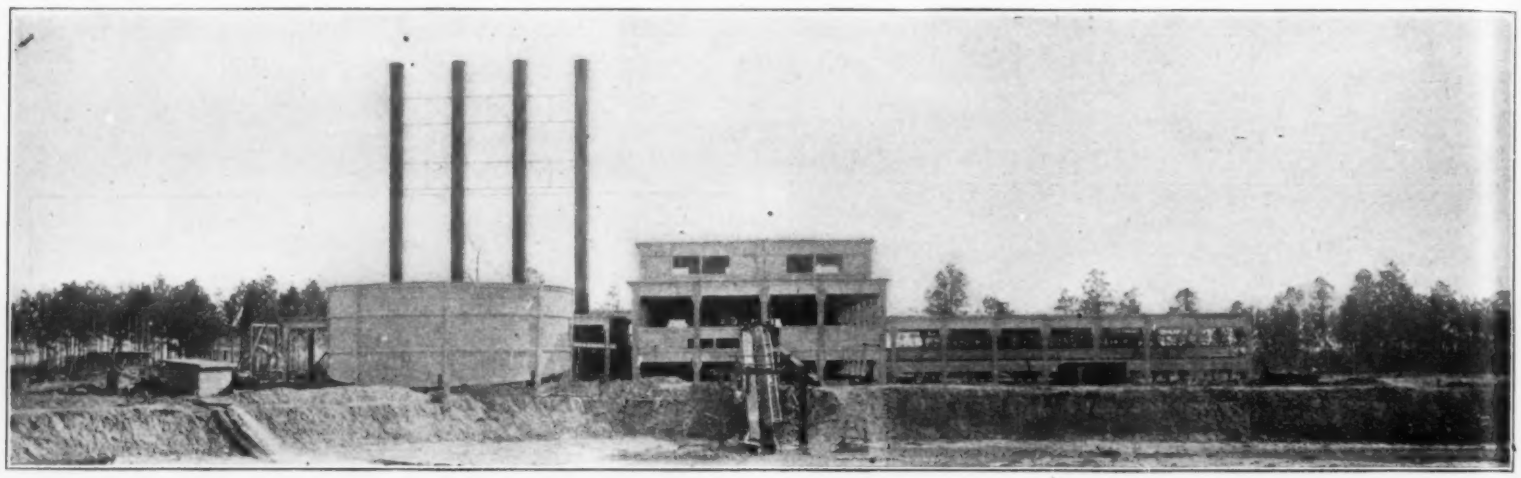
GASTON COUNTY COURTHOUSE, GASTONIA, N. C.

LINCOLN COUNTY COURTHOUSE, STANFORD, KY.

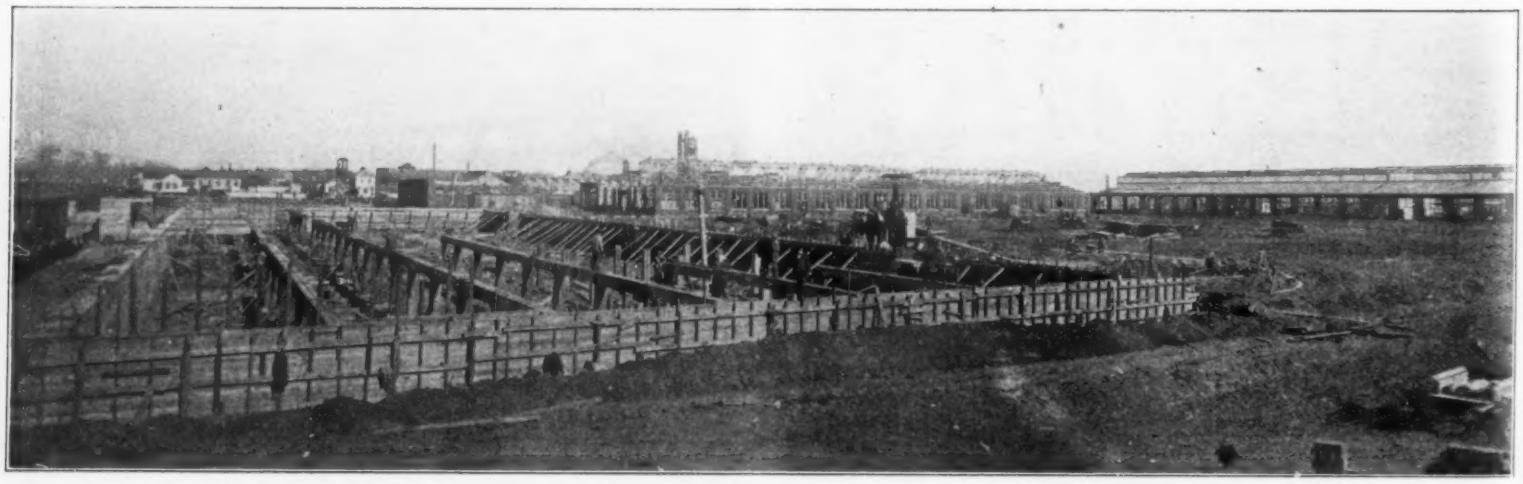
BERKELEY COUNTY COURTHOUSE, MARTINSBURG, W. VA.



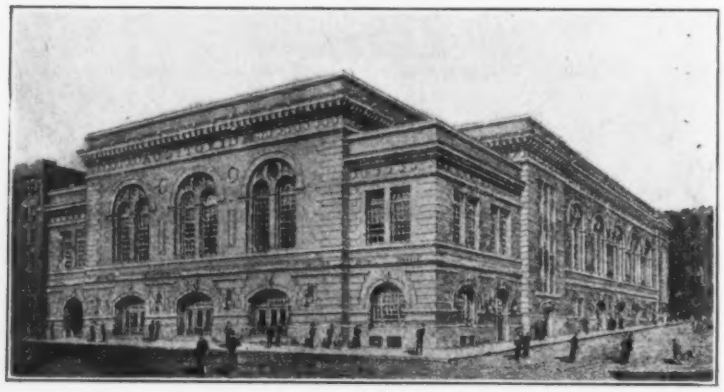
REINFORCED CONCRETE PLANT, HEBARD CYPRESS CO., WAYCROSS, GA.



REINFORCED CONCRETE PLANT, HEBARD CYPRESS CO., WAYCROSS, GA.

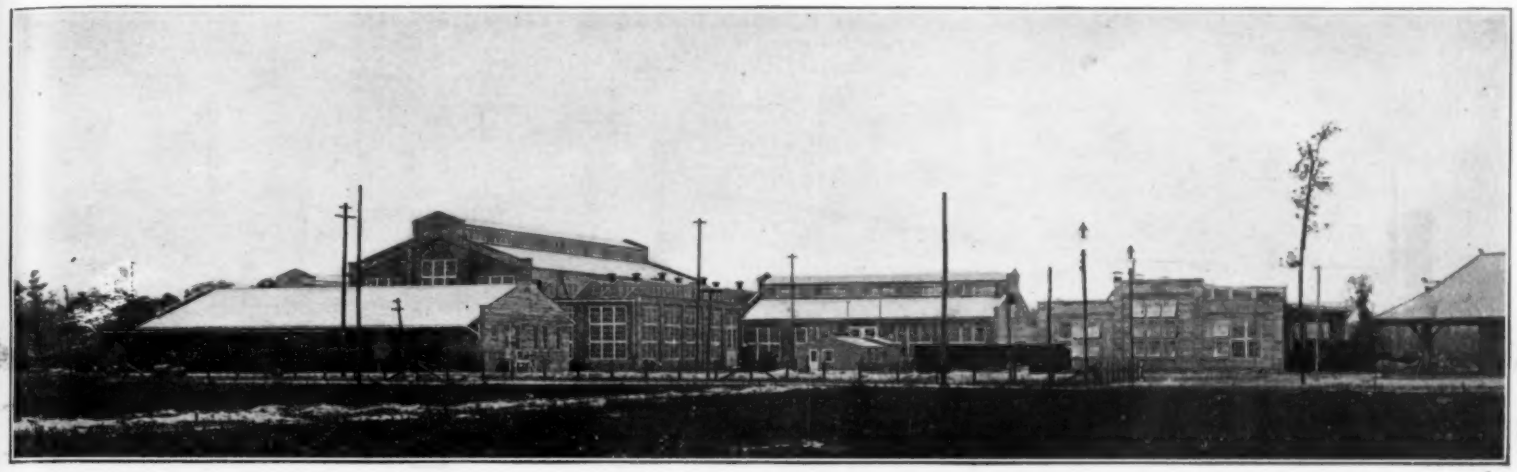


B. F. AVERY & SONS' PLOW AND AGRICULTURAL IMPLEMENT PLANT, LOUISVILLE, KY.

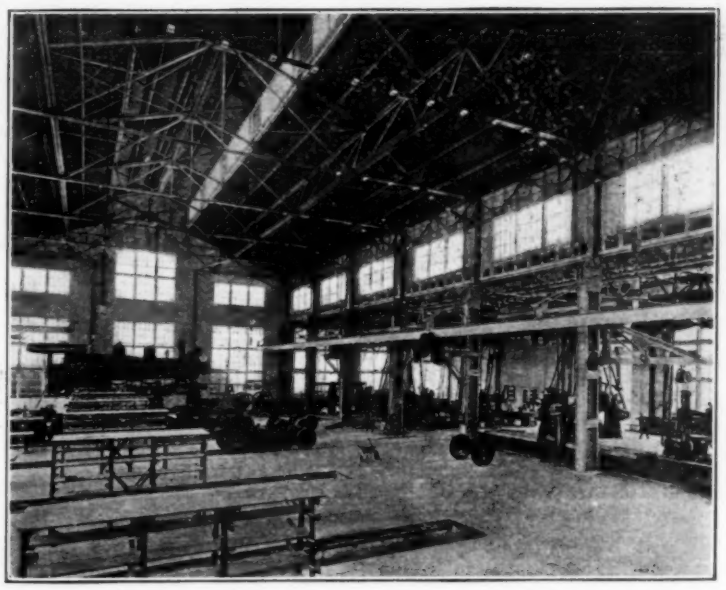


AUDITORIUM, HOUSTON, TEX.

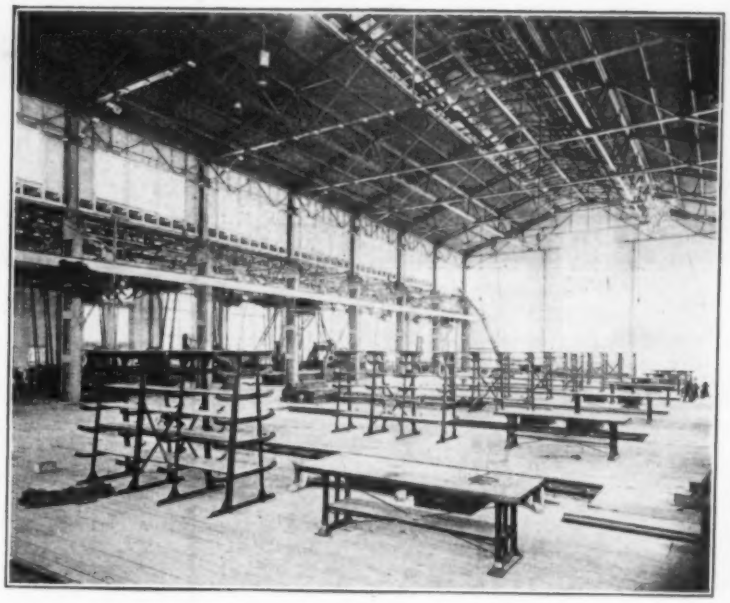
MUNICIPAL BUILDING AND AUDITORIUM, RALEIGH, N. C.



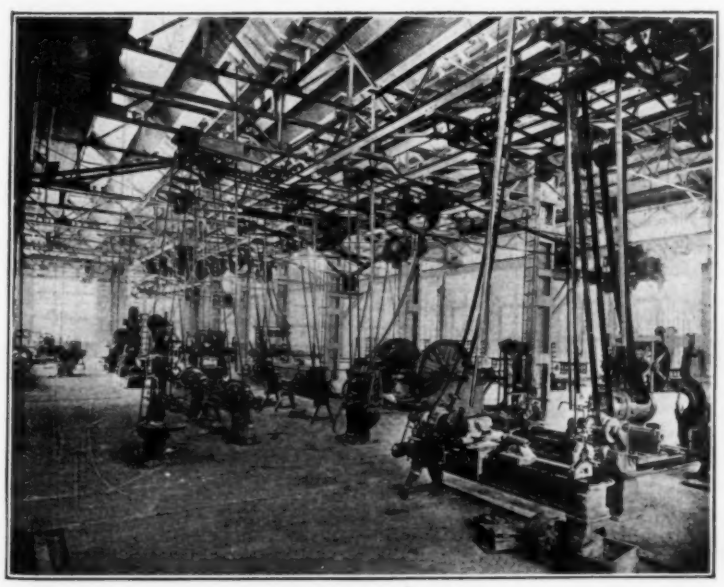
NEW ORLEANS GREAT NORTHERN RAILROAD SHOPS, BOGALUSA, LA.



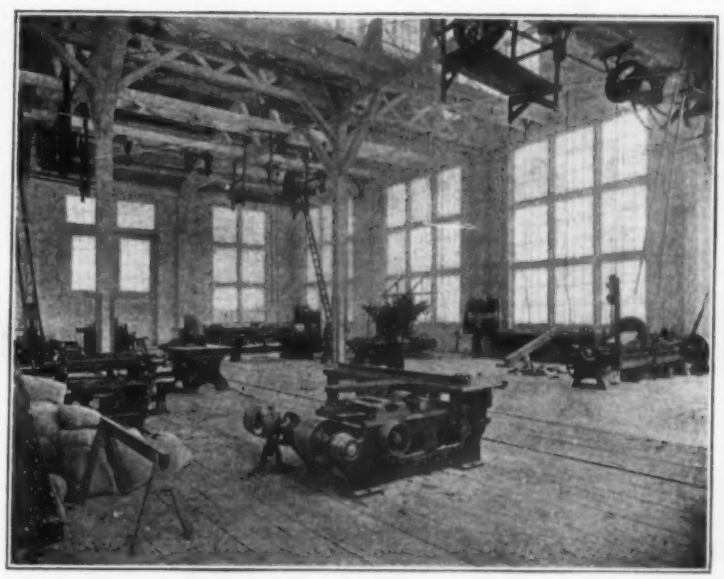
INTERIOR LOCOMOTIVE SHOP, N. O. G. N. R. R., BOGALUSA, LA.



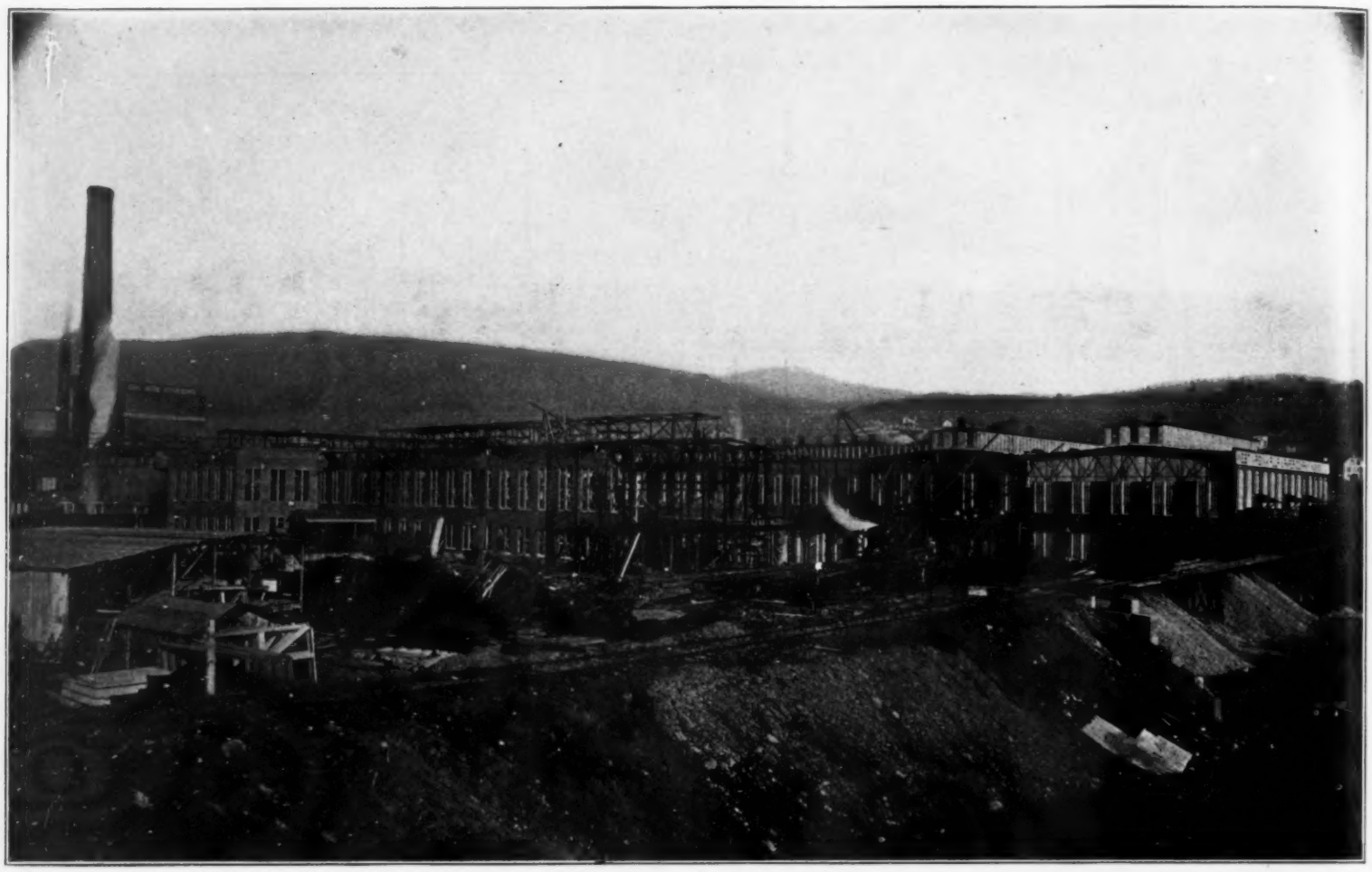
ERECTING BAY IN LOCOMOTIVE SHOP, N. O. G. N. R. R., BOGALUSA, LA.



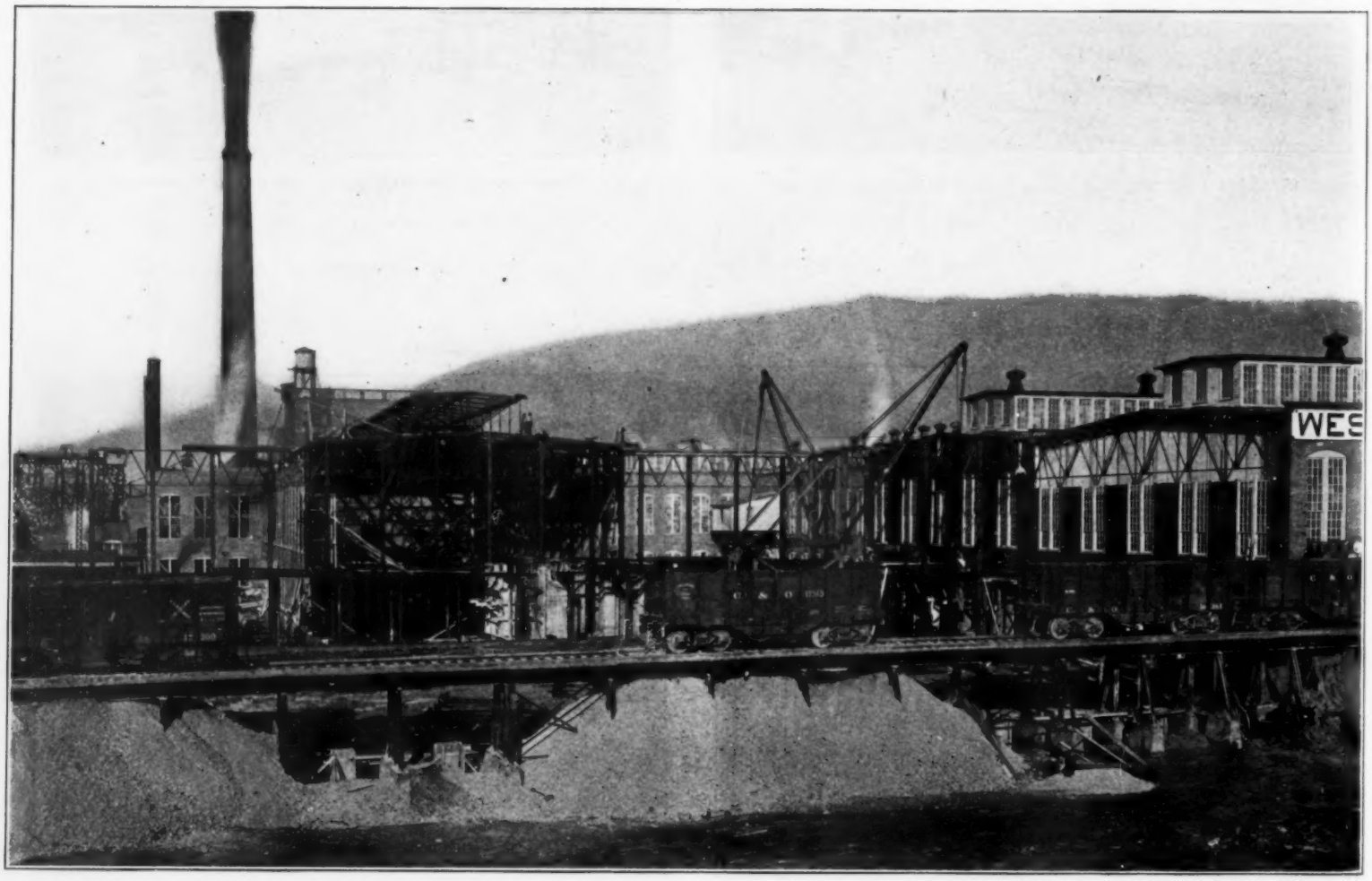
MACHINE BAY IN LOCOMOTIVE SHOP, N. O. G. N. R. R., BOGALUSA, LA.



WOODWORKING SHOP, N. O. G. N. R. R., BOGALUSA, LA.

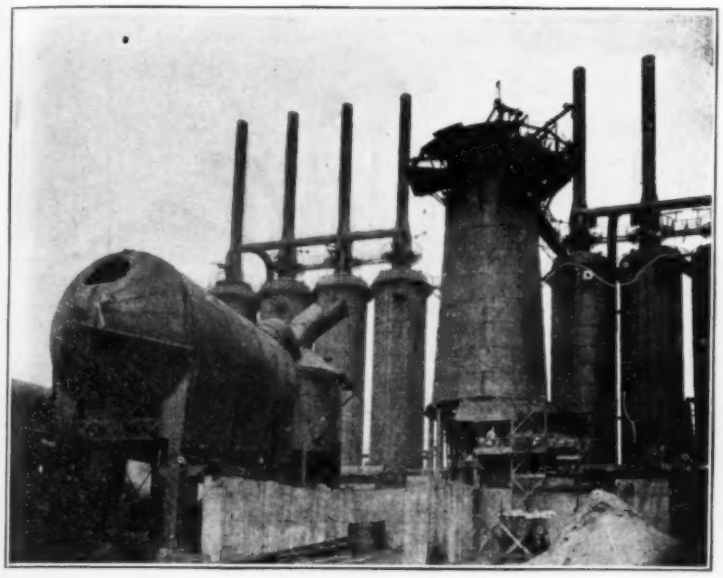


EXTENSIVE ENLARGEMENTS TO PLANT OF WEST VIRGINIA PULP & PAPER CO., COVINGTON, VA.

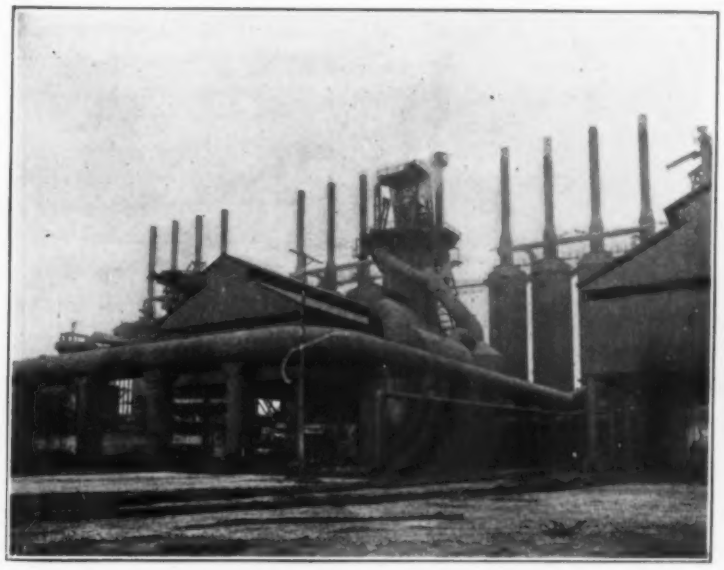


EXTENSIVE ENLARGEMENTS TO PLANT OF WEST VIRGINIA PULP & PAPER CO., COVINGTON, VA.

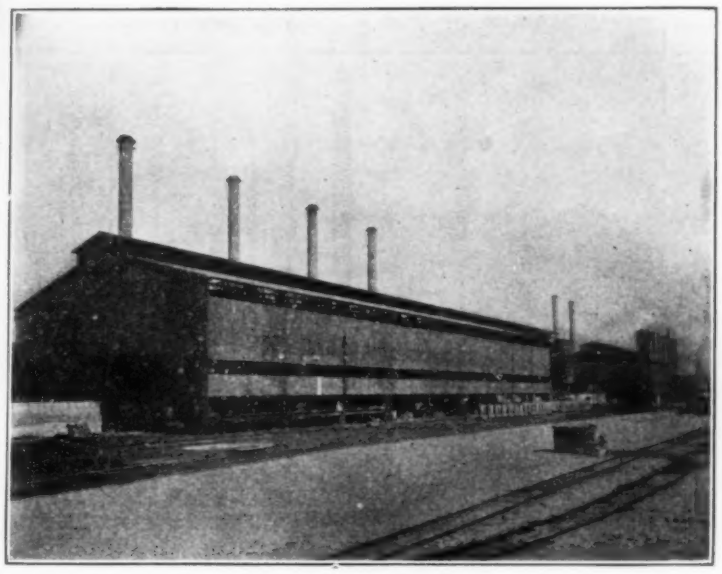
VIEWS AT ENSLEY PLANT OF TENNESSEE COAL, IRON & RAILROAD CO.



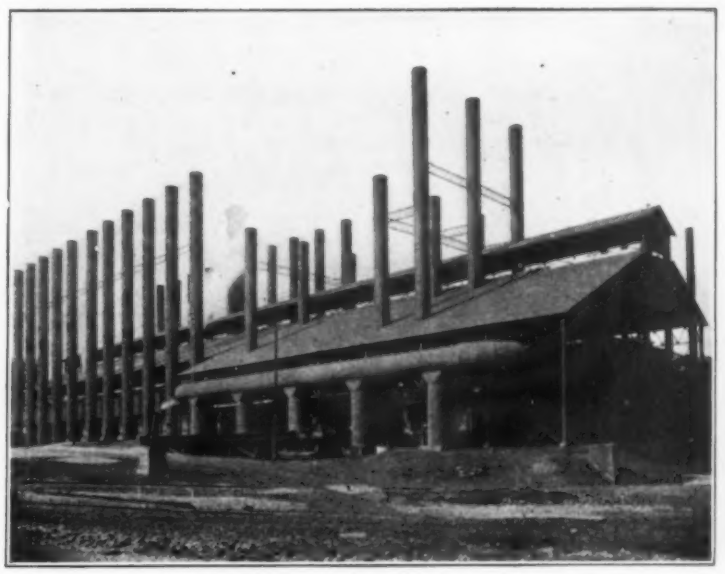
BLAST FURNACE NO. 2, IN COURSE OF CONSTRUCTION. TAKEN SEPTEMBER 17, 1909.



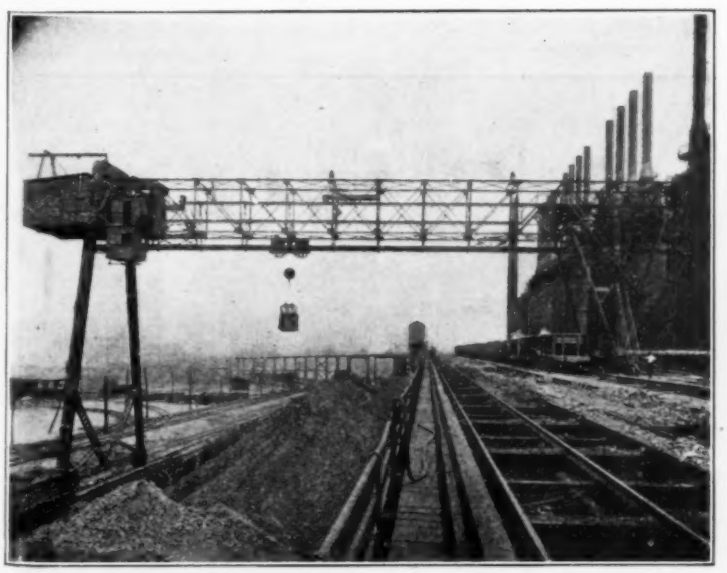
BLAST FURNACE NO. 3. TAKEN SEPTEMBER 23, 1909.



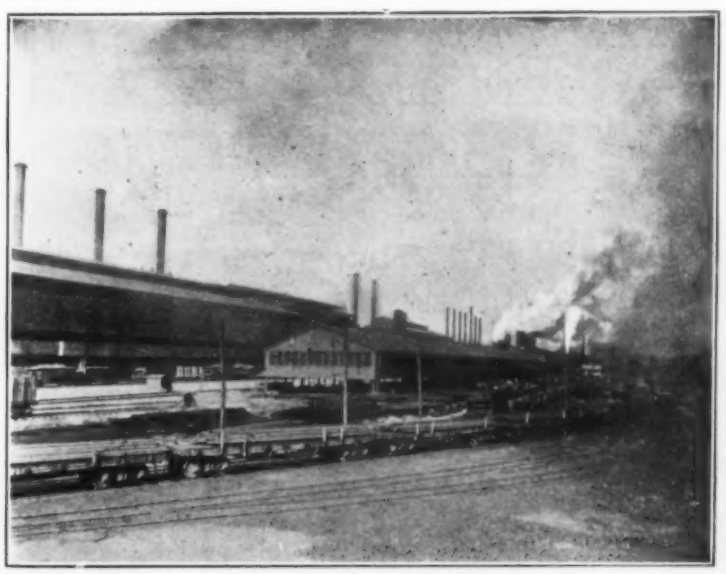
NO. 2 OPEN-HEARTH, LOOKING NORTHEAST TOWARD THE OLD OPEN-HEARTH PLANT. TAKEN OCTOBER 21, 1909.



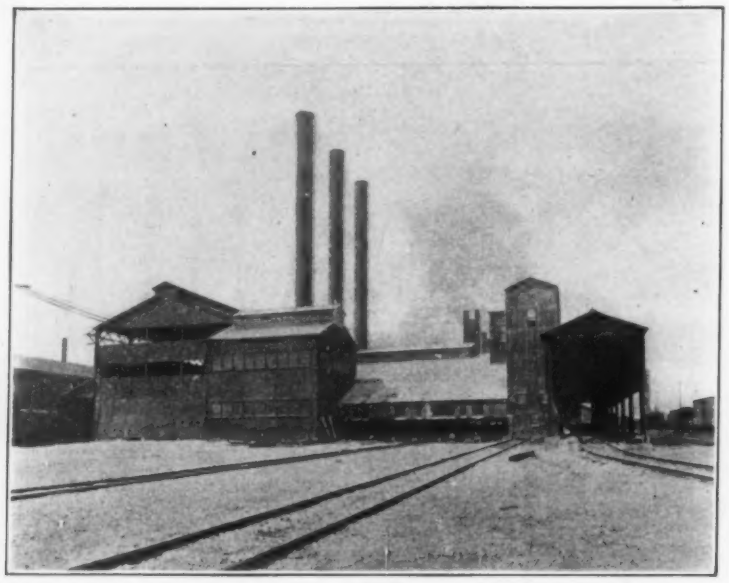
RUST BOILER PLANT AT THE POWER-HOUSE. TAKEN SEPTEMBER 23, 1909.



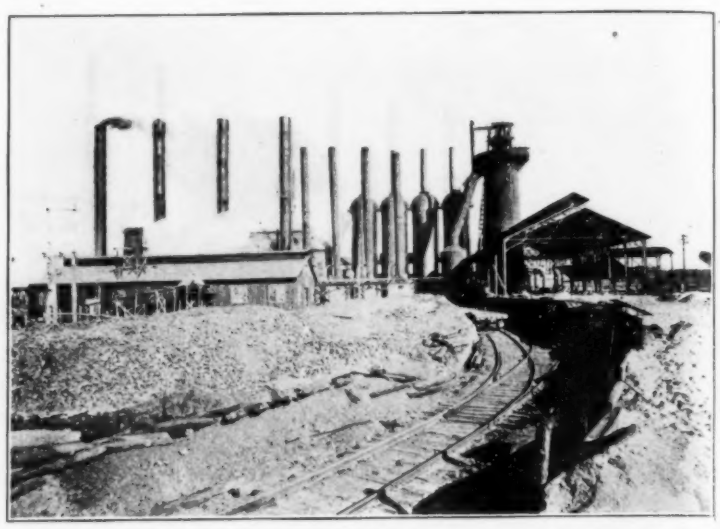
ORE BRIDGE AT BLAST FURNACES. TAKEN SEPTEMBER 22, 1909.



RAIL-FINISHING MILL AND NO. 2 OPEN-HEARTH. TAKEN OCTOBER 21, 1909.

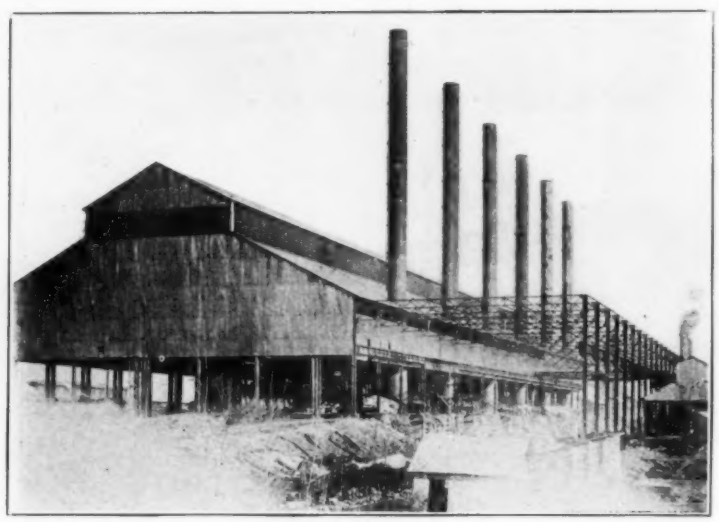


LIME-BURNING AND DOLOMITE PLANT, TENNESSEE COAL, IRON & RAILROAD CO., ENSLEY, ALA. TAKEN SEPTEMBER 21, 1909.



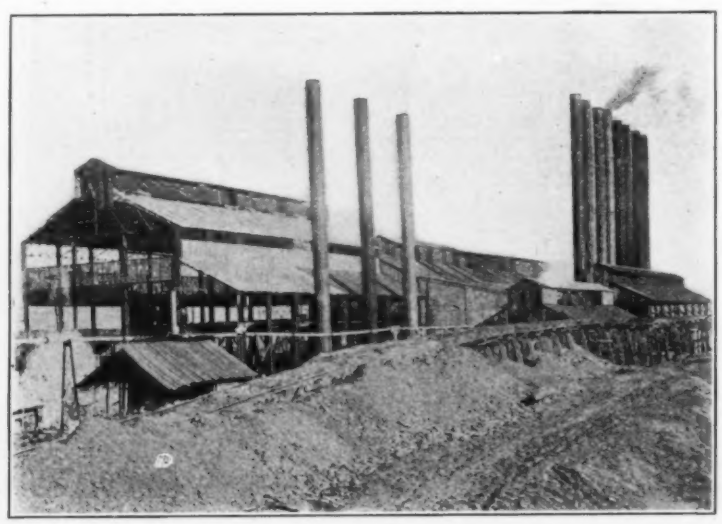
BLAST FURNACE AND POWER-HOUSE, SOUTHERN IRON & STEEL CO., GADSDEN, ALA.

PARTIAL VIEW MEMPHIS PLANT, VIRGINIA BRIDGE & IRON CO.



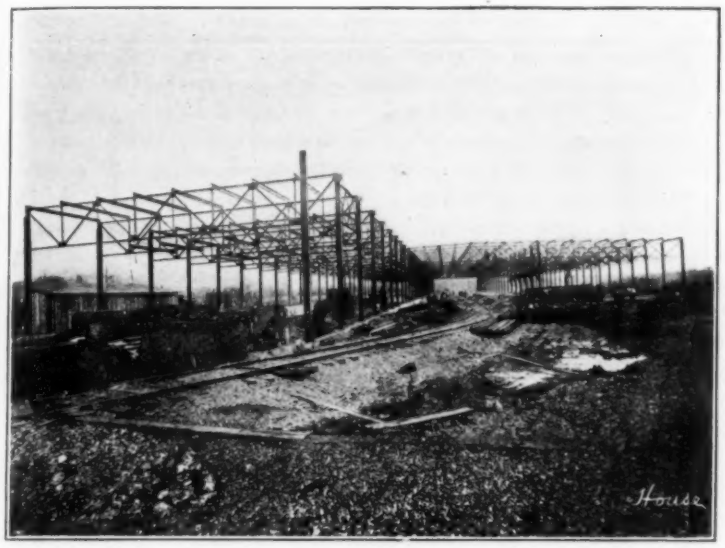
OPEN-HEARTH PLANT, SOUTHERN IRON & STEEL CO., GADSDEN, ALA.

ATLANTA PLANT, VIRGINIA BRIDGE & IRON CO.

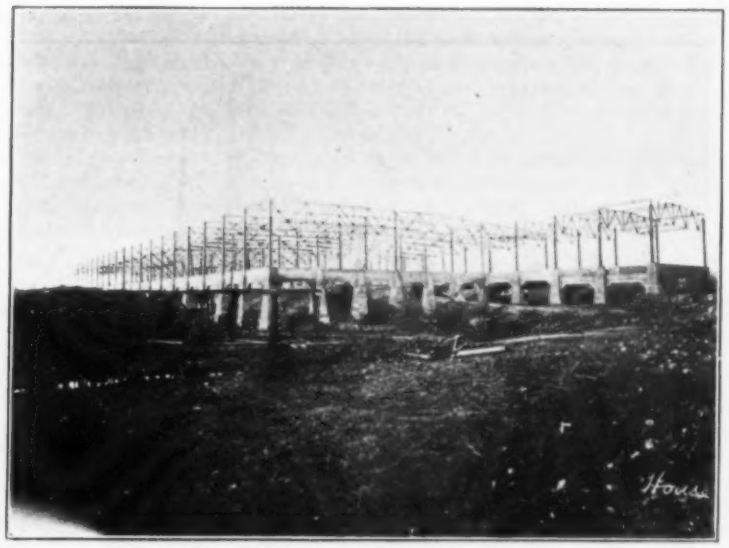


GAS PRODUCERS FOR SOAKING PITS, SOUTHERN IRON & STEEL CO., GADSDEN, ALA.

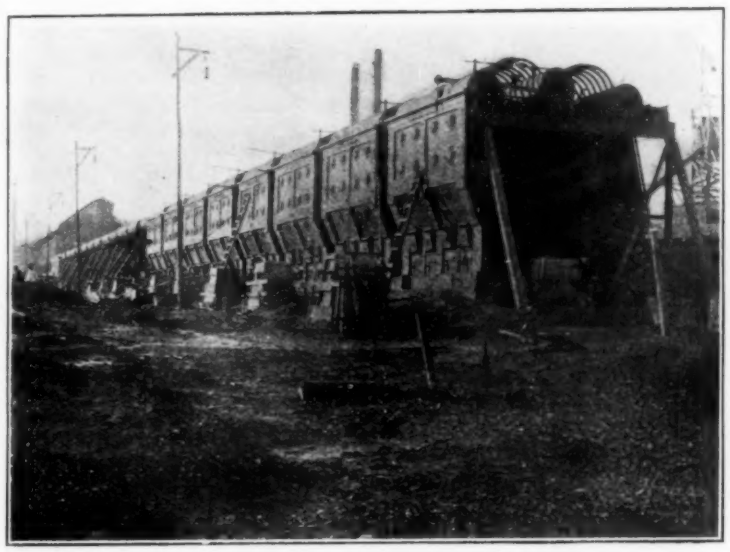
VIEWS OF NEW PLANT, SOUTHERN IRON & STEEL CO., GADSDEN, ALA.



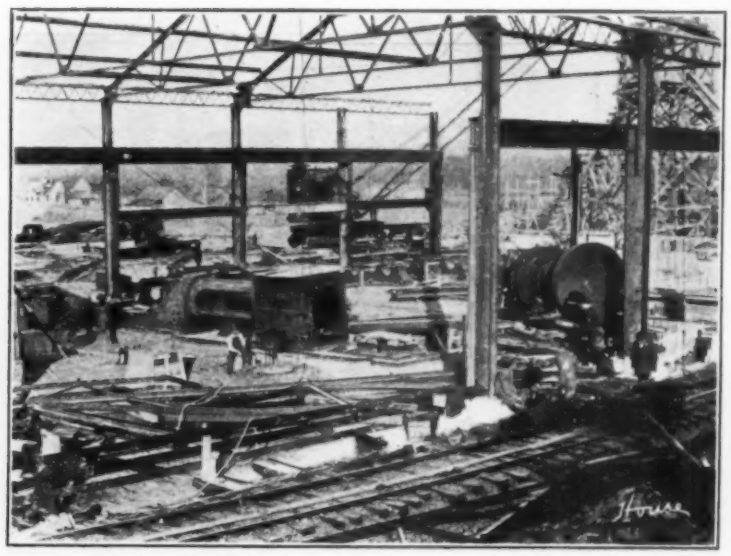
FRONT VIEW WIRE, ROD AND NAIL BUILDINGS.



REAR VIEW WIRE, ROD AND NAIL BUILDINGS.

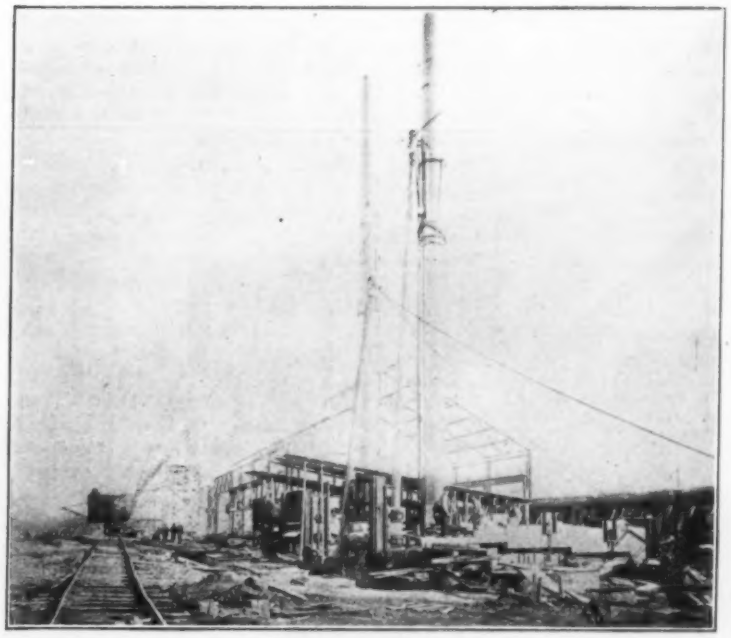


ROD AND WIRE MILL BOILER PLANT.



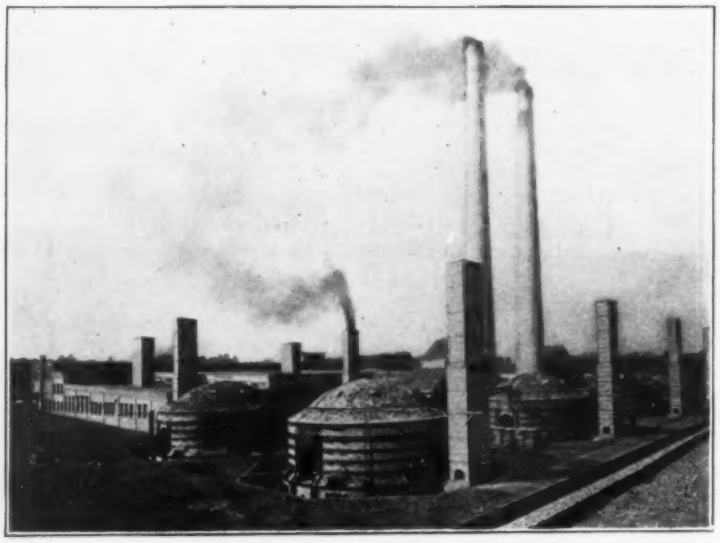
ROD MILL 16-INCH CONTINUOUS MILL ENGINE.

BLOOMING MILL AND SOAKING PITS.



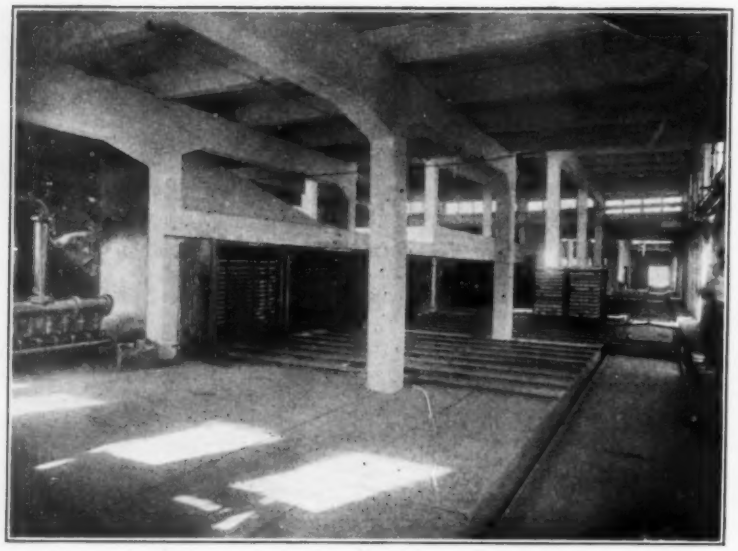
ROD MILL REHEATING FURNACES.

VIEWS OF NEW PLANT, HARBISON-WALKER REFRACTORIES CO., WYLAM, ALA.

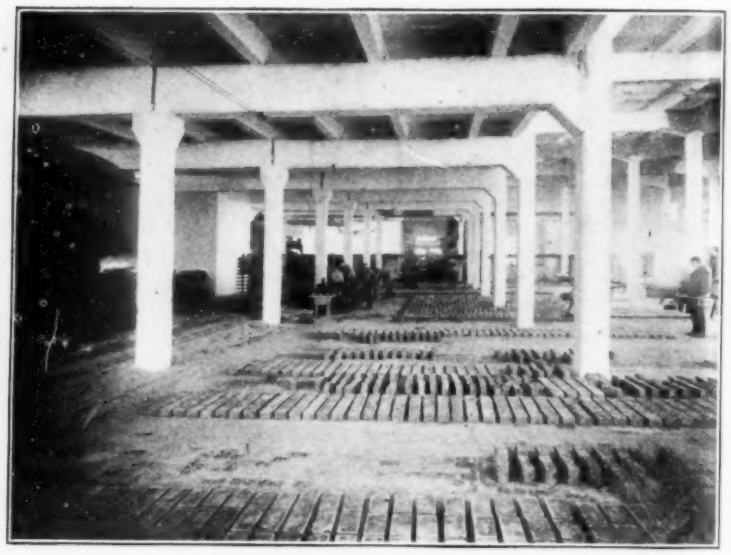


GENERAL VIEW OF PLANT.

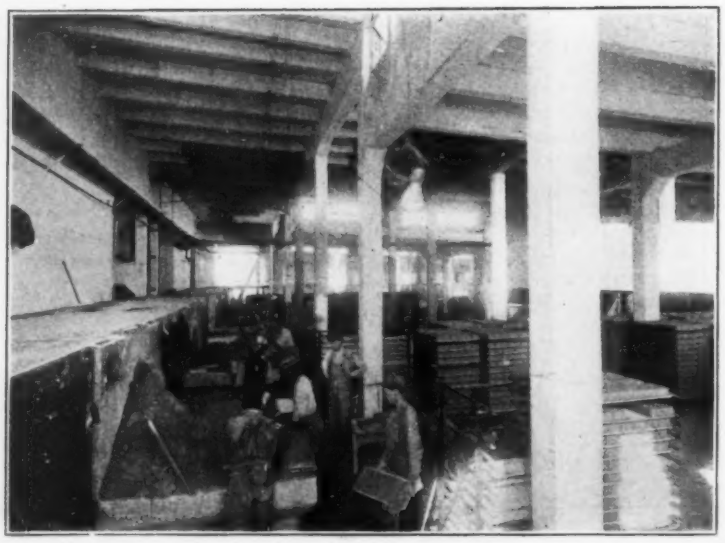
REINFORCED CONCRETE DOUBLE-TRACK TRESTLE AND SILICA ROCK BINS.



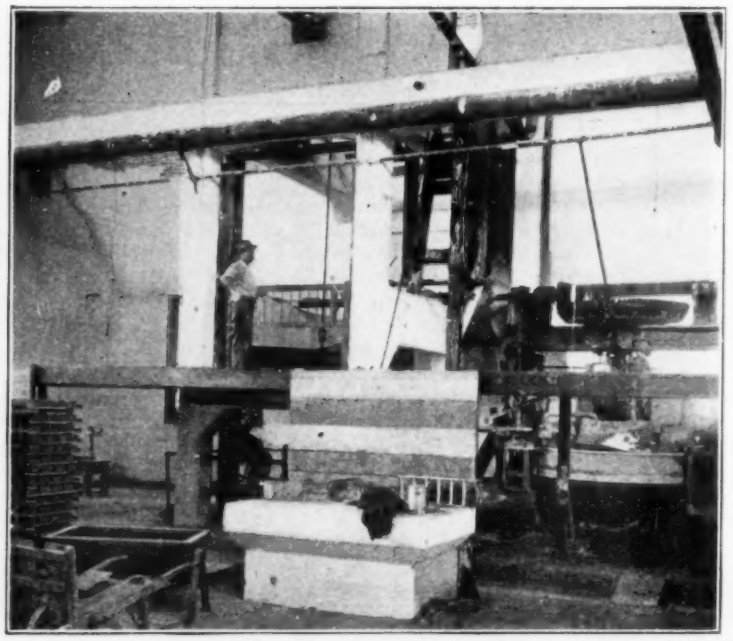
A SECTION OF DRIERS.



FIRE-CLAY BRICK FLOOR.



SILICA CLAY TABLES.



SILICA GRINDING PANS AND ELEVATOR.

Iron and Steel and Kindred Interests in Alabama.

By Y. A. Dyer of Birmingham.

[Written for the Manufacturers' Record.]

When the United States Steel Corporation entered the Birmingham district, some two years ago, there was much concern manifested by Birmingham people as to the ultimate outcome as to the purposes and policy of the "newcomer." The most consoling effect was the policy of placing George G. Crawford, a Southern man of the highest type of citizenship, training and technical knowledge of the iron and steel business, in charge of its affairs. His worth is highly appreciated by the people of the district. Whatever other doubt may have existed up to the time, it was forever expelled on September 23, 1909, when President Crawford first announced, in the columns of the Manufacturers' Record, that during his past two years' stay in the district he had made a careful study of the whole situation with a view to diversifying and expanding the steel products of the Tennessee Company, and that by reason of the fact the company was hampered on every hand by lack of sufficient water supply, a plan had been adopted whereby an impounding reservoir, with a pumping capacity of 25,000,000 gallons per day, would be constructed, to have an impounding capacity of 2,500,000,000 gallons. President Crawford stated: "When this water supply is secured it will be possible to proceed with the plans for extending the company's operations to meet the requirements of the Southern market." Therefore, the plans as to the water supply once settled, the mention of one project followed closely on the heels of another. About 1700 acres of land were purchased, extending from Wylam on the north to Dolomite on the south, and connecting lands with the Tennessee Company owned on Flint Ridge with the company's lands on the west side of Opossum Valley. This gives the Tennessee Company all of the flat level lands in Opossum Valley between Wylam and Dolomite. The construction work of the dam has been contracted for, and is being prosecuted at this time. Plans are being drawn up covering the big batteries of by-product coke ovens, with capacity of 3000 tons of coke per day. On October 11, 1909, President Crawford further announced that the company had decided to erect two additional 100-ton open-hearth furnaces. At this time, as the writer witnessed, work of erection is well under way, and when completed there will be a total of eight up-to-date open-hearth furnaces at the steel mill. Five of the large blast furnaces at the Ensley plant have been rebuilt from the ground up and modernized in every respect, and the sixth will shortly be rebuilt.

As further evidence of the Corporation's faith in the future of the South and the Birmingham district, and its properties in this section, on November 16 Mr. Wm. E. Corey, president of the United States Steel Corporation, wired the Manufacturers' Record that appropriation had been made for the erection, by the American Steel & Wire Co., of a $3,000,000 rod and wire plant at Ensley, which was followed on November 22 by formal announcement of plans by Mr. Wm. P. Palmer, president of above subsudiary company, providing for the erection of an electrically-driven mill, the initial power to be generated by the gas from the by-product coke-oven plant which is to be erected by the Tennessee Company, which company will also supply the steel billets. Now that all these vast improvements are becoming actualities, it is not difficult for one to clearly see the foresight displayed by the officials of the Steel Corporation, as well as the heads of the subsidiary companies mentioned above, in forming a nucleus in this district for varied iron and steel industries with which to supply not only the needs of the South now and in the future, but a good percentage of the world's needs. With an eye to the immediate future, it has not been slow to recognize the opportunities offered along this line by the Latin-American countries.

Take, for instance, the developments going on in the different South American countries and provinces—territory which is now accessible via the Gulf and the Atlantic. The Tennessee Company is at present and has been shipping to the Argentine Republic Ensley-made rails from the ports of Pensacola and Savannah. The matter of reckoning time by the Corporation would appear to be the regarding of years as months, and the policy as to the matter of initial cost of installing costly plants as being satisfactory if good results are reasonably pointed out even five or ten years hence. We are promised by the Government that within a period of some five years the Panama Canal will have been opened and ready for use. This means the lead to new fields which are broad, and the possibilities of which are beyond the scope of anticipation at present. It also not only means a revelation in the way of Southern iron and steel activity, but will materially stimulate the import and export trade in general. According to statistics, our Latin-American imports in 1908 amounted to $273,176,971; in 1909, $324,139,999, a gain of $50,963,028. In 1908 the exports amounted to $219,968,558; in 1909, $201,912,874, a loss of $18,055,684. In this connection it is a matter of interest to know that, in round numbers, the imports of only five South American countries—Chile, Argentina, Brazil, Colombia and Guinea—amount to $272,500,000, and the exports $405,225,000. In Argentina and Chile alone the railroad work going on at present is enormous, and it is reasonable to suppose that structural steel of all kinds within the next five years will be called for at a very rapid rate, judging from present progress there. Therefore, with the opening of the Panama Canal not only the extreme western provinces of South America will become directly accessible by water transportation, but the far eastern trade will loom up in great proportions. Possibly Japan and China within the next few years will eclipse any other country on the globe in the laying of railroad lines. It is interesting to note also that the imports of Japan, China, Australia and Oceania approximate $504,000,000, and exports $462,000,000. Beyond question the broad-sighted officials of the Steel Corporation weighed these conditions carefully, then began to lay their plans early to meet them, thereby getting in on the ground floor. Does it not, then, therefore, bear out to the letter the prediction made in 1900 by the late Abram S. Hewitt, a prominent ironmaster who was once heavily interested in this district, that the Birmingham district is destined to become a dominating factor in the iron and steel world?

It is hardly possible to do justice to the situation by this brief description of some of the improvements already made by the Corporation since its entrance into the district, and the carrying out of those which have been planned, should reference be omitted to some of the remarks made by Judge E. H. Gary, chairman of the board of the Steel Corporation, at a banquet tendered him at the Country Club in Birmingham on the evening of December 17. The Judge said, among other things, that $7,000,000 had already been appropriated for improvements by the Tennessee Company and its subsidiaries, in addition to the $6,500,000 already spent, and that they were proud of the fact that their ore holdings in the Birmingham district approximated 700,000,000 tons, to say nothing of the vast coal deposits and limestone and dolomite within a very short distance of each other. He sounded the keynote to the situation and displayed his great confidence in the district when he said that with their operations here 30 per cent. of the population of the country could be advantageously supplied by their Southern plants. "With these conditions existing," he said, "the people of the South have good reason to be optimistic."

The general offices of the company are in the Brown-Marx Building, Birmingham, Ala., which require the entire space of three floors, approximately 150 offices. The officials in charge are George Gordon Crawford, president; F. H. Crockard, vice-president and general manager; H. C. Ryding, assistant to the vice-president.

Southern Iron & Steel Co.

To appreciate the wonderful progress made in the way of excavating, concrete and steel construction work since August last on the site of the new wire, rod, nail and other finished product plants of the Southern Iron & Steel Co. at Gadsden, Ala., one must refer to photographs taken October 15 and reproduced in the Manufacturers' Record October 28, 1909. Today, instead of a broad, open and undeveloped area of some 250 acres of land, the eye is greeted by massive new structural steel and concrete work at the extreme eastern end of the old billet mill. One of the illustrations shows 14 batteries of Stirling type boilers, 375 horse-power each, and eight batteries of 505 horse-power each same type boilers, all equipped with safety explosion doors and other modern conveniences, and of open-hearth steel construction, as other cuts show on pages 150 and 151; six Duff gas producers for supplying fuel for the reheaters; three Alex. Laughlin reheating furnaces; new rod mill building and Allis-Chalmers rolling-mill engines; wire, nail and fence-wire buildings; warehouse 60x300 feet, etc. In addition to completely repairing the four already installed open-hearth furnaces, two additional open-hearth furnaces are practically completed, making a total of six furnaces with daily capacity of 600 tons of steel. Work is sufficiently under way to discern the complete and well-thought-out plan of operation, which is particularly worthy of mention. The entire plant is thoroughly equipped for the complete conversion of the raw material into finished products of different kinds, ready for the consumer. Take, as illustration of the continuous operation, the ore and trace its course. It is brought in at the extreme western end of the plant to the blast furnace, where it is reduced in a 300-ton capacity furnace, equipped with all modern appliances and labor-saving devices. While there is installed at the furnace a pig-casting machine, to be used in case of accident preventing operation of steel mill, operations will chiefly consist of casting the molten metal into 50-ton ladles to be carried to the open-hearth furnaces, where the second process of conversion takes place, eliminating, as far as practicable, the impurities and casting the steel into 70-ton ladles, which are handled by electric cranes to the ingot molds. Immediately after the steel solidifies the molds are stripped of ingots by an electric stripper of the latest design, which is now being installed. The ingot, in its almost white-heat condition, is then taken on a tram car to the soaking pit, which keeps it at a uniform heat awaiting its turn through the bloom rolls operated by a 5000-horse-power reversing engine of the Tod type. The rolls reduce the ingot to a billet four inches square, which passes on through the shear, where it is cut, while hot, into a length approximating in weight 180 pounds. The billet is then in shape for either rolling into rods, for which purpose only the middle portion is used, or piling on the yard for sale on the open market, or conversion into merchant bar. After it passes through the rolls it is at a dark heat, and is then passed through the reheating furnace on a conveyor operated by variable-speed motors, dropping it at the front of the furnace by gravity, ready to be passed through another set of rolls which are operated by a 3000-horse-power cross-compound Allis-Chalmers engine. It passes on down through the rolls to the eighth pass, at which point it becomes a narrow ribbon-shaped piece of metal, and loops backward and forward through a series of other rolls until it assumes the shape of a round rod about three-eighths inch in thickness. It is then wound on a reel and carried into the storage yard, ready for the wire process. This process begins at the extreme northwestern end of the building, shown in the illustration, where it is first given a bath in diluted sulphuric acid, next dipped in a solution of caustic lime, and then taken to the baker, where it is thoroughly reheated. After coming from the baker the rod is cooled and passes to the wire-drawing blocks, which are of the latest Humphrey patent, with all possible safety devices. From the drawing-room the wire divides and passes to the nailroom and to the galvanizing-room, all being handled by electric telpherage system. In the nailroom the nails are cleaned and kegged, going directly to the warehouse. From the galvanizing-room the wire passes to the field-fence room on one side and the barbed-wire room in the center. From the field-fence room the woven fencing is taken in coils to the warehouse, and from the barbing-room the wire, wound on wooden spools, passes to the warehouse, all ready for shipment. Thus the iron ore which passes in at the gate on the right passes out on parallel tracks on the left within a fey days' time in the form of finished product, ready for the jobber. The layout of the entire plant is ideal, and clearly shows the wisdom and foresight of the officials in charge of the construction end.

Alongside the eastern end of the warehouse a ravine is quite prominent, which was more forcibly brought to the attention of the writer in an interview with Capt. W. P. Lay, one of the pioneers of Gadsden, and the father of the scientific researches as to the conservation of water-power, etc., on the Coosa River. "When plans have been fully matured," said the Captain, in his characteristic style, "the waters of the Coosa River will be forced up against the very warehouse of the steel plant through the waters of Black Creek, thereby giving the products of the plant access to the market of the world by water transportation. This is one of the good things that is to come directly in reach of our eyes when our hopes are fully realized as to the conservation of our great waterway, the Coosa. We began the policy for co-ordination and dual development of water-power and navigation a number of years ago, and made very extensive studies along this line only three or four years ago. The results promised by such studies were so flattering that the past session of Congress agreed to an appropriation for a survey to determine definitely the results, and a complete report of same, together with certain other interesting data, will be duly filed before the end of December, this year, and the Coosa River Improvement Association will appear before Congress early in January next year. The report will comprise the first complete and comprehensive plan for modern development of a river system in this country. It will be completed in its every detail, and is very unique. It also promises most splendid results, and the association

feels confident that it will be successful in having plans adopted for immediate improvement."

All of this, of course, is very interesting, and shows conclusively what may be well expected in the way of economy, ultimately, as to power transmission not only to the plant of the Southern Iron & Steel Co. at Gadsden, but to other enterprises and industries along the course of the Coosa River on its way to the Gulf.

General headquarters of the Southern Iron & Steel Co. are located at 1022-1052 Brown-Marx Building, Birmingham, Ala.; Mr. W. H. Hassenger, president; F. B. Keiser, vice-president in charge of operations; A. R. Forsyth, secretary and treasurer. The office of Mr. John Y. Brooks, manager of works, will be at the plant, Alabama City, Ala.

Harbison-Walker Refractories Co.

One of the most recent important acquisitions—which not only adds to the material welfare but prestige of the district—is the Ensley plant of the Harbison-Walker Refractories Co., located on about 19 acres of land due west and about one-half mile outside the city limits of Greater Birmingham. The finishing touches are being applied to this plant, and at present two kilns are under fire. At this plant will be manufactured high-grade refractory brick of different brands, composition and designs. The main buildings are constructed of solid reinforced concrete, having concrete roofs covered with three-ply gravel and tar, erected by the R. A. Cummings Structural Concrete Co. of Pittsburg, Pa. One of the photographs on page 152 furnishes a good view of the reinforced concrete double-track trestle and storage binds for silica rock. This high-grade silica rock is mined by the company at its Gannister quarry, near Anniston, Ala., and underwent its initial test of mixture and manufacture at the Pittsburg plant of the company, and the resultant brick were given a thorough test by the Tennessee Coal, Iron & Railroad Co. at its Ensley plant. In this way an exhaustive test was effected both as to the manufacture of the brick and their suitableness for open-hearth work; therefore, the making and using of these brick is in nowise an experiment. Another photograph shows the two 150-foot draft stacks which take care of the eight kilns; also shows one kiln in use. It also furnishes a good view of the boilers. The kilns and boilers, as operated, furnish a striking lesson as to economy in the carrying on of an extensive business of this kind. The kilns are equipped with the Parsons furnace, which system of burning greatly reduces fuel consumption. They have a capacity of 100,000 nine-inch brick, and when in use furnish gas for the firing of the boilers. After having been under fire their usual period they stand closed for 10 days, during which time the waste heat passes from same to the heat chambers and is blown by a 10-foot fan into the hot-air driers, a section of which is shown in one of the photos. The waste steam is carried by a system of conduits under the floor on which is piled the fire-clay brick, thereby extracting a certain amount of moisture from the green brick before they are carried to be repressed. When in full operation 250 to 300 men will be employed. The plant will be operated exclusively on hand-made brick. The hard silica rock, after being finely crushed, passes to the grinding pans, and there pulverized and moistened. From the grinding pans it is mechanically forced out into buggies and elevated to a structural steel platform running around the walls of the plant and delivered to the molders' tables, two of which are shown in operation on silica clay. In this connection one of the features that struck the writer most forcibly was the entire use of native labor. On questioning the superintendent, Mr. J. B. Agnew, Jr., as to the efficiency of the labor as compared with the labor at the Northern and Western plants of the company, he stated that the men on the tables had become practically experts, even with their experience thus far. It is interesting to note and proper to state in this connection that it is claimed that beyond question, by expert and scientific tests, hand-made brick are far superior to machine-made brick and give much longer life in a furnace. For this reason nothing but hand-made brick will be manufactured at this plant.

The equipment and design of the plant make it the most modern of its kind in the United States, if not the world, having a capacity of 20,000 silica and 20,000 fire-brick per day. The facilities for handling the raw material and finished product are the best that experience and modern methods suggest, and it is entered by both the Louisville & Nashville Railroad and Southern Railway tracks, thereby furnishing adequate transportation facilities for all purposes. In addition to the high-grade silica open-hearth and by-product coke-oven brick, all shapes of regular blast furnace "inwall" and "top" brick, beehive coke oven and boiler setting brick will be made from a mixture of native Alabama fire-clay with the flint clays from the fields of Kentucky. The company estimates that not less than 75 per cent. of the fire-brick necessary for a blast furnace will be manufactured at its Ensley plant; also lime-bond silica brick for beehive and Belgium coke-oven crowns will be turned out. These latter brick are similar to the open-hearth and by-product coke-oven brick, but less refractory and considerably cheaper in price. This class brick is already in use by most of the modern coke-oven plants in the North, and in time it is reasonable to suppose that the lime-bond silica brick will supplant the old clay brick now in use in the South. It is practicaly indestructible, on account of its mixture and manufacture, and will go far in eliminating the now heavy cost of coke-oven repairs. Piping brick, together with a large majority of hot-blast stove brick, will be manufactured. The company has spent considerable money in its study of refractories for boiler setting, and a brick for this purpose has been decided on. It has been the policy of the company, in the selection of its brands of brick, to make them as nearly as practicable indicative of the characteristics of the sections in which the plants are located. To that end the following brands have been selected for its Southern plant:

Silica open-hearth and by-product oven brick	"S-Star"
Boiler and stove brick	"Southern"
Silica crown for beehive coke ovens	"Coosa"
Blast-furnace brick	"Southern-Inwall" and "Southern-Top"
Third-quality brick	"Wylam"

The Birmingham offices of the company are located at 830 Brown-Marx Building, with W. H. Hill, sales agent, in charge of its affairs.

This modern fire-brick plant is not only a valuable asset to the district in accentuating the progressive trend of the Birmingham district toward eventually evolving plans, ways and means for establishing within its borders diversified plants to take care of the wants of dependent home industries, thereby keeping capital within our borders, but it means the saving of thousands of dollars to the iron and steel making plants here, as well as coke-oven operators, in freight rates. This is, indeed, a most important factor when it comes to be dealt with.

To Induce Capital and Immigration to the South.

By PAUL T. BRADY of Westinghouse Electric & Manufacturing Co., New York.

[Written for the Manufacturers' Record.]

In answer to your question as to what the South should do to invite immigration and capital, the experience of the writer leads him to believe that publicity and the general diffusion of knowledge as to what the country is and what it contains is one of the most needful requisites the situation demands today.

For example, the people of the West and Northwest are today spending thousands and thousands of dollars in the newspapers and in various publications printed and distributed at the expense of the railroads, towns and villages represented by the different Chambers of Commerce and Boards of Trade in such towns and villages, and they are reaping a great harvest from same.

The result of this advertising and distribution of literature is that people become acquainted with what is happening in that country and curiosity is aroused to see for themselves the land of promise as it is presented, and their vacations are spent in a trip through the West. As an evidence of this, the city of Portland, Ore., entertained during the months of August and September 12,000 transients each day. These people did not all come to buy, to settle or make their homes in that distant country. They came from curiosity, for pleasure and with other motives. But many acquired a knowledge of the country which later opened the door for a consideration of investments that are offered in that country, and many invested in lands, buildings, mortgages, etc., when they were there. Others remained to settle and grow up with the country; others returned with a knowledge of the country that they could not get in any other way.

The railroads themselves have been of great assistance in this diffusion of knowledge, paying, as they have in many instances, part of the cost of publication and advertising and giving, as they do every season, a rate of fare that enables people to go from New York to Seattle, Portland, San Francisco and Los Angeles—a trip of nearly 9000 miles—at a cost little more than the expense of taking a trip to Florida or New Orleans, a distance of 2500 miles.

This cheap railroad fare and advertising has built up the Northwest. The South in a measure is a sealed book to thousands and millions of people residing north of Mason and Dixon line. As an example, I might cite my own experience: Up to three years ago I had never been south of the city of Washington, although I had traveled a million miles over the northern part of the United States and knew it from one end of the country to the other, but my knowledge of the South was limited to what I had read in a few newspapers, the reports of the fiery orations of some of your speakers in the halls of Congress and school-day stories which I had acquired from school books then in existence, many of which were grossly unfair to that country.

My first trip, an immediate result of becoming interested in the South through reading the MANUFACTURERS' RECORD, was a revelation; the second, a confirmation, and other trips taken since have only been the means of wanting more and more to go to that beautiful and rich country.

The only publications which I have seen from the South are those which are supplied by the MANUFACTURERS' RECORD. If the "Blue Book" which you have sent out this year could be distributed far and wide through this broad land, its benefit would be incalculable, but you could not afford to do it.* Every railroad, every city and town and every manufacturer should take some of these books and distribute them to their customers, to bankers and financial people throughout the country. People of the North are not the parties to do that. They are not exploiting the South; it is for the South that this advertising is done.

In addition to the pamphlet referred to, every Chamber of Commerce and Board of Trade should get out pamphlets, and in those pamphlets they should show what they have and what they can do in their respective localities. If John Jones can raise a fine crop of cotton, tell about it. If Sam Smith can raise a fine crop of peaches, oranges, melons or something else, tell the story so that it is interesting reading to people. This is what they are doing in the Northwest, and what they ought to do in the South. Every Chamber of Commerce should take up with the railroads running from the North to the South the question of making excursion rates, so that people could afford to go there. The railroads would benefit by this as well as every industry dependent upon the South. The greater the population and the greater the exploitation of your natural resources, the more benefit it is to the railroads, as well as everyone else.

The reputation of the Southern States for its dealing with capital, railroads, etc., during the past few years is not good. I understand and realize that many of the States have seen the error of their ways, and are now disposed to and are acting fairly toward capital, enterprise and energy that may come to them from the outside. It is proper that they should do so, for you cannot force capital to make its investment with you. Money for new enterprises will go only where it can get a premium. It is not content with 4, 5 or 6 per cent., and especially where it is a question of building a railroad, opening a coal mine, developing a water-power or exploiting some new field where chances have to be taken, it is only reasonable and just that a premium should be paid.

In my experience in getting money to put into new enterprises in the South, while practically this money comes through banks, trust companies, etc., the ultimate owners of your cotton mills, water-powers, iron mines and other industries are not the bankers and trust companies, but ten thousand small investors scattered far and wide through this broad land. The cry of the "yellow journals" against the banker and the capitalist should have no effect with your people. The money that is going into your country is not the money of the banker, trust company and the enormously rich, but the investment of people who see possibilities of reasonable returns upon the money they entrust under the care and guardianship of your laws. Therefore, the South should be fair to this money, and in that way they will be fair to themselves.

The South is rich in mines of iron, coal and numbers of other metals and materials: it is rich in its forests; rich in its broad fields; in its cotton-growing States and in a

*Note.—The MANUFACTURERS' RECORD has distributed at its own expense 30,000 copies of its "Annual Blue Book of Southern Progress" in all parts of the country and abroad.

thousand and one other resources that people hardly realize it contains. It now needs money and energy to develop these resources, and its aim should be reasonable laws under which capital can be invested and people assured of protection in its investment.

The South needs additional population. The only way that this population can be induced or invited to come there is by telling people of this country what your great possibilities are. It is for the people of the South to do this, and I hope that the work you have started and are doing will be seconded a thousandfold by the many and numerous agencies of the South themselves, as they are capable and willing to take this work up if they are only shown how.

$15,000,000 FOR SOUTHERN CHURCH BUILDING.

By A. C. VANDEVER.

[Written for the Manufacturers' Record.]

In October the MANUFACTURERS' RECORD published a list of church edifices reported within its columns as having been built, in course of erection or definitely planned during the first nine months of 1909 in the 14 Southern States, the District of Columbia, Oklahoma and Missouri. The cost of these structures aggregated approximately $13,000,000. Since that publication some new buildings have been reported, and these have been added to the columns previously given. The following table presents the complete number of new buildings for the year, as reported to the MANUFACTURERS' RECORD, with their cost, by States:

States.	No. of new churches.	Cost.
Alabama	44	$1,091,700
Arkansas	29	311,600
District of Columbia	7	565,000
Georgia	37	1,013,700
Florida	16	360,000
Kentucky	18	668,500
Louisiana	14	425,900
Maryland	25	1,600,600
Mississippi	16	359,600
Missouri	27	1,743,000
North Carolina	32	451,900
Oklahoma	22	647,000
South Carolina	31	397,500
Tennessee	55	1,210,500
Texas	108	2,845,700
Virginia	48	966,000
West Virginia	13	363,900
	533	$15,022,100

As previously stated, the list of new churches, as noted in the Construction Department of the MANUFACTURERS' RECORD, must be somewhat incomplete, since many small edifices, built in country places, are not here included. Also our weekly records show an increase in the number of churches with cost not yet estimated or ready for announcement, these now being nearly 150 in number for the year.

The elaborated table accompanying this statement is a summary of the South's church-building activities for 1909, and is arranged according to States, religious bodies and cost. The table includes the October statement, with information since furnished, and presents a total of over $15,000,000 expended for church-building work during the year just ended—a vast expenditure for the betterment of the home folk of the South, and of those who are welcomed or received within its borders.

Again, it is found convenient to group under the heading of "Various" a number of edifices erected by denominations building but one or two structures each during the year within the States named. These, as before, include Christian Advent, Christian Science, Congregational, Evangelical Lutheran, First Reformed, Friends, German Evangelical, Greek Catholic, Reformed, Reformed Presbyterian, Seventh Day Advent and United Brethren, with yet a small number of edifices whose denominations were not reported to the MANUFACTURERS' RECORD, when information as to cost, etc., was supplied.

Cost of Church Edifices Built, in Course of Erection or Planned in the South and Southwest in 1909.

	Methodist.	Baptist.	Protestant Episcopal.	Presbyterian.	Catholic.	Christian.	Lutheran.	Jewish.	Various.	
Alabama	$415,200	$420,500	$40,000	$53,000	$20,000	.....	.....	$75,000	$68,000	$1,091,700
Arkansas	56,000	183,000	.....	32,500	.....	$29,000	.....	.....	11,100	311,600
District of Columbia	320,000	15,000	.....	5,000	.....	.....	$25,000	.....	200,000	565,000
Georgia	456,200	320,500	.....	60,000	63,500	5,000	8,500	50,000	50,000	1,013,700
Florida	77,000	220,000	.....	25,000	8,000	.....	.....	30,000	.....	360,000
Kentucky	109,500	316,000	.....	15,000	100,000	128,000	.....	.....	.....	668,500
Louisiana	4,000	34,000	.....	10,000	175,500	.....	.....	2,400	200,000	425,900
Maryland	144,600	7,500	1,040,000	.....	15,000	.....	112,000	15,000	266,500	1,600,600
Mississippi	231,600	25,000	10,000	.....	.....	.....	.....	.....	93,000	359,600
Missouri	533,000	105,000	300,000	98,000	392,000	140,000	10,000	.....	165,000	1,743,000
North Carolina	237,500	98,000	.....	33,200	.....	.....	13,000	.....	70,200	451,900
Oklahoma	246,000	76,500	124,500	165,000	.....	35,000	.....	.....	.....	647,000
South Carolina	81,500	171,500	.....	58,500	35,000	20,000	16,000	.....	15,000	397,500
Tennessee	212,000	386,500	7,000	545,000	.....	7,000	8,000	.....	45,000	1,210,500
Texas	1,166,000	690,000	189,000	334,700	191,000	204,000	9,000	25,000	37,000	2,845,700
Virginia	184,500	366,000	165,000	13,500	.....	103,000	58,000	13,000	63,000	966,000
West Virginia	265,400	13,500	.....	10,000	.....	50,000	25,000	.....	.....	363,900
	$4,740,000	$3,448,500	$1,875,500	$1,458,400	$1,000,000	$721,000	$284,500	$210,400	$1,283,800	$15,022,100

Great Activity in Southern Textiles in 1909.

By HERBERT C. CALDWELL.

[Written for the Manufacturers' Record.]

That the Southern cotton manufacturing industry had a steady advance during 1909 has been shown by the MANUFACTURERS' RECORD'S quarterly reports during the year and the current news of the industry presented from week to week. The fact of this advance is further emphasized by today's review, presenting data as to plans for new mills and the enlargement of established plants during the entire 12 months. Cotton manufacturers of the South are realizing more and more the possibilities of their section for textile milling, and their frequent announcements of additions to spindles and looms prove their faith in the future of the industry. Moreover, not only Southern mill managers, but also those of New England and other parts of the country, are investing in Southern mills.

It is interesting to note that the greater percentage of the spindles and looms being installed from time to time in the South are additions to the facilities of existing plants, while many of the strictly new companies are formed wholly or in part by men interested in established and successful cotton factories. These enterprises require the expenditure of millions of dollars, which add to the wealth of the South and provide employment for many thousands of her people. In many instances the construction of a new mill entails the establishment of an entirely new city, with water supply, sewer system, electric-lighting equipment, improved streets and sidewalks, modern cottages for the operatives and other facilities for the health, comfort and contentment of the employes, as well as schools for the education of their children, churches for their religious training, etc.

An important feature in Southern cotton milling is the adoption of electricity for power, and many of the new mills are equipped for its use, while a number of the existing plants have changed their power equipment to the electrical drive. A year ago the Southern Power Co. of Charlotte was furnishing electricity for power in more than 100 cotton factories in North and South Carolina, and today it is meeting the electrical needs of many additional mills. In fact, some 80 per cent. of the company's present supply of electricity (over 100,000 horse-power) is being used by cotton mills. These facilities include 800 miles of transmission lines and more than 50 substations, the power being transmitted at high voltage and reduced at the consuming location to meet the needs of the purchaser.

During October, November and December announcements were made as to decisions for the instalation of 97,892 spindles and 2749 looms, which means an investment of approximately $2,500,000, about half of these amounts being for the new corporations and the other half for the existing companies.

The total for the year is 932,320 spindles and 19,237 looms, requiring an investment of more than $23,000,000. Comparing these figures with the 147,808 spindles, an investment of $2,700,000, for 1908, it is evident to what an extent activity has increased in adding to Southern mills.

Among the important 1909 announcements (previously detailed) which may be briefly mentioned at this time were the following: Erwin Cotton Mills, West Durham, N. C., adding a mill of 50,000 spindles and 1500 looms, costing $1,000,000; Dan River Power & Manufacturing Co., Danville, Va., adding a mill of 50,000 spindles and 1500 looms, costing $1,000,000; Brandon Mills, Greenville, S. C., adding a mill of 25,000 spindles and 700 looms, costing $500,000; Woodside Cotton Mills, Greenville, S. C., addition of 25,000 spindles and 650 looms, costing $500,000; Inman Mills, Inman, S. C., addition of 13,600 spindles and 340 looms, costing $300,000; Locke Cotton Mills Co., Concord, N. C., plant of 45,000 spindles, costing $900,000; Waverly Cotton Mills, Laurinburg, N. C., 20,000-spindle plant, costing $400,000; Columbus Manufacturing Co., Columbus, Ga., adding 20,000 spindles and 600 looms; Efird Manufacturing Co., Albermarle, N. C., adding 15,000 spindles; Wiscassett Mills Co., Albemarle, N. C., adding 25,000 spindles; Arcadia Mills, Arcadia, S. C., adding 10,000 spindles and 250 looms; Eureka Cotton Mills, Chester, S. C., adding 10,000 spindles and 300 looms; Newberry Cotton Mills, Newberry, S. C., adding 10,000 spindles and 300 looms; Beaumont Manufacturing Co., Spartanburg, S. C., adding 16,000 spindles and 350 looms; Patterson Mills Co., Roanoke Rapids, N. C., 22,000 spindles and 750 looms, costing $500,000; Republic Cotton Mills, Great Falls, S. C., 25,000 spindles and 1000 looms, costing $600,000; Manchester Cotton Mills, Manchester, Ga., 20,000 spindles and 475 looms, costing $500,000; Entwistle Manufacturing Co., Rockingham, N. C., 40,000 spindles and 1000 looms, costing $800,000, etc.

Below is presented a tabulated list of the title, location and equipment of the various new companies and those announcing enlargements, as reported during the last quarter of 1909:

Name.	Location.	Spindles.	Looms.
Alabama.			
*Anniston Yarn Mill	Anniston	3,000	....
Verlina Cotton Mills	Jacksonville	.....	200
		3,000	200
Georgia.			
*Star Thread Mills	Athens	7,000	....
*Canton Cotton Mills	Canton	10,000	274
*Whittier Mills Co.	Chattahoochee	5,000	....
*Fort Valley Yarn Mill	Fort Valley	2,100	....
		24,100	274
North Carolina.			
*Osage Manufacturing Co.	Bessemer City	.....	400
*Victory Manufacturing Co.	Fayetteville	1,792	40
*Flint Manufacturing Co.	Gastonia	2,000	....
Surry Manufacturing Co.	Mt. Airy	.....	....
Finwin Cotton Mill Co.	North Wilkesboro	.....	....
Jennings Cotton Mill Co.	Lumberton	.....	....
River Falls Cotton Mills Co.	River Falls	20,000	....
		23,792	440
South Carolina.			
*Anderson Cotton Mills	Anderson	2,000	....
Parker Manufacturing Co.	Columbia	.....	....
Glencoe Cotton Mills	Columbia	.....	....
Alice Mills	Easley	10,000	300
Republic Cotton Mills	Great Falls	25,000	1000
		37,000	1300
Tennessee.			
*Warloto Cotton Mills	Nashville	5,000	135
		5,000	135
Texas.			
South Houston Beginning & Mfg. Co.	Houston	.....	....
Lone Star Cotton Mill	McKinney	5,000	400
Marble Falls Cotton Mills Co.	Marble Falls	.....	....
		5,000	400
Virginia.			
Meherrin Cotton Mills	Emporia	.....	....
Total for first quarter of 1909		268,880	5330
Total for second quarter of 1909		389,212	7480
Total for third quarter of 1909		176,336	3678
Total for fourth quarter of 1909		97,892	2749
Total for year of 1909		932,320	19,237

*Established mills enlarging.

RAILROADS

[A complete record of all new railroad building in the South will be found in the Construction Department.]

RAILROADS IN TEXAS.

Commissioner W. D. Williams Gives Interesting Statistics of Great Progress.

[Special Cor. Manufacturers' Record.]

Rusk, Tex., December 29.

Hon. William D. Williams, a member of the Texas Railroad Commission, in reply to an inquiry from your correspondent, writes:

"The last published report of the commission brings the statistics down to June 30, 1908. Since that time there has been constructed in this State a total railroad mileage of approximately 677 miles, information of which was reported prior to June 30, 1908. The construction was distributed as follows, to wit:

	Miles.
Abilene & Southern	58.0
Asherton & Gulf Railway	32.1
Artesian Belt	14.8
Burrs Ferry, Browndel & Chester	4.0
Concho, San Saba & Llano Valley	16.5
Chicago, Rock Island & Gulf	48.2
Estacado & Gulf	8.0
Groveton, Lufkin & Northern	21.2
Gulf, Texas & Western	49.0
Kansas City, Mexico & Orient	146.9
Marshall & East Texas	2.0
Roscoe, Snyder & Pacific	20.0
Shreveport, Houston & Gulf	9.0
Stamford & Northwestern	55.5
Quanah, Acme & Pacific	38.0
Texas State Railroad	17.9
Texas & New Orleans	8.5
Texas & Gulf	21.3
Trinity Valley Northern	10.0
Texas Southeastern Railway	27.1
Pecos & Northern Texas	45.0
Timpson & Henderson	30.0
Total	677.0

"As nearly as can be approximated without calling for special reports, the present total mileage in Texas is 13,857.4 miles, which seems to put Texas ahead of all other States in railroad mileage.

"According to the reports which we have received, there is over 500 miles of railroad under construction, no part of which is given in the figures given above. The greater portion of this new work is upon the Santa Fe lines in Northwest Texas, but there are quite a number of small lines which are also included.

"Progress in equipment has been very slow. The following is a comparative list of the equipment owned at the close of the fiscal year ending June 30, 1908, and at the close of the fiscal year ending June 30, 1909:

	June 30, 1908.	June 30, 1909.	Increase.
Engines	1,789	1,887	98
Passenger cars	1,145	1,169	24
Freight cars	43,060	44,582	1,522
Other cars	3,577	3,655	78

"We have no special reports showing increased service and facilities for passenger traffic, and, so far as I am aware, the new trains which have been put into operation recently are but two in number. One of these is a fast passenger train over the Missouri, Kansas & Texas Railway from St. Louis to Texas points, and the other is a through passenger train over the Frisco lines from Houston to New Orleans. I believe the Frisco has also put on a new train from Texas to St. Louis, but may be mistaken in this.

"This office has no control over the equipment of rolling stock with safety appliances, but from observations made by our force when out on an inspection, we believe the Texas roads are making an honest effort to comply with the statutes passed by our recent Legislatures, and that they are generally installing automatic equipment as rapidly as can reasonably be done.

"The mileage reported up to June 30, 1908, was 12,901.4 miles. The mileage at present, estimated, as already stated, is 13,857.4 miles.

"The gross earnings of Texas roads for 1908 was $81,776,691.03, and for the year ending June 30, 1909, $90,429,450.38. The increase from June 30, 1908, to June 30, 1909, was $8,652,759.35 gross.

"The net earnings for the year ending June 30, 1908, were $13,671,642.12, and for the year ending June 30, 1909, the net earnings for the year were $22,384,151.88. The increase in net earnings for the year was $8,712,509.76.

"As a whole, the Texas roads show a very marked increase in gross and net earnings, and the building of new lines through Texas is progressing as rapidly as could be reasonably expected."

Gulf, Texas & Western's Progress.

A letter from an officer of the Gulf, Texas & Western Railway Co. to the MANUFACTURERS' RECORD encloses a copy of the report made by R. D. Barker, engineer, to the Texas Railroad Commission, recommending that the company be authorized to issue bonds and stock in the sum of $1,461,154.81. As recently reported, this company built during 1909 from Jacksboro, Tex., via Olney (40 miles) to Seymour, Tex., a total of 75 miles, but when Mr. Barker's inspection was made, some time before the end of the year, there was not that much completed. He says in his report:

"I found their line practically completed for the 50 miles and in operation between Jacksboro and Olney. Their standards of construction are good, and the line is well built, permanent waterways having been installed wherever practicable. The grading of this line was expensive, due to the character of the country traversed between Olney and Jacksboro, where rock excavation amounts to a considerable item of expense. Their track is laid with 67-pound steel, 80 per cent. heart pine and oak ties. Their buildings are from plans common in standard, and are neat and adequate structures. At Jacksboro a stone structure for passenger depot is being erected, and was about 85 per cent. complete when I inspected the line. All other depots are frame structures of good design. So far as my information goes, this line is the first to use reinforced concrete masonry on original construction in Texas. They have, as my estimate shows, invested about $20,000 in culvert work of this material, some of the structures being very creditable. They propose to ballast the track throughout.

"Their maximum grade is 1 per cent. and the maximum curve 5 degrees. It was necessary, however, to use this maximum but in one instance, and the maximum of 4 degrees of curve prevails. Their embankments are built to standard width of 16 feet and cuts 22 feet, slopes the usual inclination, one and one-half to one and one to one, though most of the cuts are taken out to full slope, even where rock was encountered.

"They are at present erecting a metallic circuit telephone line on cedar poles for use in operation of trains. A portion of this work has been done."

WESTERN MARYLAND.

Pittsburg Extension May Be Constructed to Connect With New York Central.

Under the reorganization of the Western Maryland Railroad Co. some important developments are expected. It is rumored now that the long-contemplated extension in the direction of Pittsburg will be made to a connection with the Pittsburg & Lake Erie Railway of the New York Central system at New Haven, Pa. This would necessitate the building by the Western Maryland of an extension of about eighty miles from Cumberland, Md., or near there, to New Haven, Pa., and would give a route via McKeesport to Pittsburg.

The motive of this combination is coal development. The Pittsburg & Lake Erie is a coal road and as such is very profitable, but those interested in it are on the lookout for new connections to other mining regions, so as to be assured of ample traffic in the future. By connection with the Western Maryland it would have access not merely to new coal territory in Pennsylvania, but to the many mines along the Western Maryland's lines in West Virginia. The financial interests dominating the Western Maryland and the New York Central are said to be of one mind with respect to carying out this combination, which would also include, it is alleged, the Wabash, giving that road a direct route to Baltimore. The New York Central would also obtain facilities for reaching Baltimore by a new route, besides other advantages to accure from the partnership.

Following these reports is another rumor that the New York Central interests want to purchase the Western Maryland because it would give the former a short route to tidewater for its Pittsburg business and for traffic in the same section. The New York Central route from Pittsburg to the Atlantic Coast is now a roundabout one via Syracuse and Albany, N. Y., but acquisition of the Western Maryland would give a route of about half that distance from Pittsburg to the sea. If any combination or deal is made, it is expected that construction of the contemplated connection between Cumberland and New Haven will be started next spring.

New Equipment, Etc.

The New York, Philadelphia & Norfolk Railroad Co. has ordered the following equipment in 1909 to be delivered in 1910: Four consolidation improved type freight locomotives and two standard shifting locomotives; these are being built at the Juniata shops of the Pennsylvania Railroad Co.; 115 standard box cars with pressed-steel underframes, 100,000 pounds capacity, which are being built at the Altoona car shops of the Pennsylvania Railroad; also one large tugboat with steel hull and one large barge of steel with a capacity of 30 freight cars, these vessels to be used for the transfer of cars across the Chesapeake Bay, and one harbor barge of steel, with a capacity of 12 freight cars, for transfer use in Norfolk harbor.

The Roanoke Railway & Electric Co. is reported contemplating the purchase of some cars.

The Washington, Baltimore & Annapolis Electric Railroad Co. is receiving deliveries on its new interurban cars, constructed by the Niles (O.) Car Co. They are 50 feet long, and will seat 54 passengers. Each weighs 38 tons. There will be 30 pasenger cars and three express cars, and the electrical equipment permits of their being operated in trains.

The Georgia & Florida Railway has ordered six locomotives from the Baldwin Locomotive Works, Philadelphia (three passenger and three freight), all to be delivered by April 1. The company has just added two combination mail and express cars to its equipment.

The Morgantown & Dunkard Valley Railroad Co., Morgantown, W. Va., according to a report, will purchase four passenger cars and two freight cars. J. Ami Martin is general superintendent.

The Belton & Temple Traction Co., Temple, Tex., is reported in the market for a semi-convertible passenger car.

The Norfolk & Portsmouth Belt Line has ordered a six-wheel switching locomotive from the Baldwin Works.

The New Orleans & Northeastern Railroad is reported to have ordered 1600 tons of open-hearth rails from the Tennessee Coal, Iron & Railroad Co., Birmingham, Alabama.

A report from Birmingham, Ala., says that the Birmingham Railway & Power Co. is preparing to order some new equipment to be delivered this year.

L. & N.'S BIG MORTGAGE.

A Document Several Years Old, But Containing Provisions for New Lines.

An official of the Louisville & Nashville Railroad Co. telegraphs the MANUFACTURERS' RECORD that the mortgage recently filed at Beattyville, Ky., "was an old one issued in 1905. Action purely perfunctory and of no significance."

This doubtless refers to the Atlanta, Knoxville & Cincinnati division mortgage, the authorized issue of which is $50,000,000 of 4 per cents, dated April 1, 1905, and due May 1, 1955. Of this total there are $10,033,000 outstanding. There were $20,000,000 set aside to pay for the Atlanta, Knoxville & Northern Railway and the Knoxville, Lafollette & Jellico Railway, and $9,422,000 for retiring first mortgage bonds of the Kentucky Central, the Maysville & Lexington and the Atlanta, Knoxville & Northern roads, while $20,578,000, together with any surplus bonds of the two lots just described, were reserved for building or acquiring extensions. The total issued out of the entire $50,000,000 is or was (unless some recent change has been made) $21,702,000, of which $11,669,000 are in the Louisville & Nashville's treasury, leaving $10,033,000 outstanding.

It is reported in connection with the recent filing of this mortgage in Lee county that some extension is contemplated, possibly of the Louisville & Atlantic division, eastward to the coal regions of Kentucky.

A dispatch from Beattyville to the MANUFACTURERS' RECORD says that the mortgage covers the Louisville & Atlantic Railroad as well as the Cincinnati, Knoxville & Atlanta division, and it further secures a previous mortgage covering only the Cincinnati and Knoxville divisions.

To Elizabethtown, N. C.

The Lumberton & Elizabethtown Railroad Co. has been incorporated in North Carolina to build a line about 25 miles long to connect the two points named, and construction is to begin immediately. Robert C. Lawrence of Lumberton, counsel for the company, is reported as saying that there will be no delay in the work, and that the line will extend through a timber section which also presents excellent chances for agriculture. The incorporators are all residents of Lumberton, as follows: George B. McLeod, A. H. McLeod, W. P. McAlister, J. A. McDougal, F. A. Bond and Alf. H. McLeod.

The Virginia & Carolina Southern Railroad, running from Lumberton to Fayetteville, 32 miles, also contemplates building from St. Pauls to Elizabethtown, about 22 miles, and a vote will be taken January 11 in Bethel, Hollow and Elizabeth townships of Bladen county on a contemplated bond issue of $40,000 to aid the construction. As recently mentioned, also, the Raleigh & Southport Railway, 64 miles long, from Raleigh to Fayetteville, N. C., will build from Fayetteville, to Hope Mills, seven miles, and maybe from the latter point to Elizabethtown, 32 miles farther. There are also rumors that this road will be extended to either Wilmington or Southport.

May Build to Monroe and Charlotte.

Concerning the report that the Atlantic Coast Line was surveying for an extension from Hartsville, S. C., northwest, via McBee, S. C., and Monroe, N. C., to Charlotte, with a cross-line from Monroe to

Wadesboro, N. C., an officer of the company says that at this time only a reconnaissance is being made in that part of the country and no plans nor location has yet been made.

This seems to indicate that the company is thinking seriously of building a line to Charlotte, which would be of considerable advantage in connection with the new Winston-Salem Southbound Railway, which is being built from Winston-Salem to Wadesboro, N. C., by the Atlantic Coast Line and the Norfolk & Western Railway. It is estimated that the road now being constructed will not be finished until September or October next, and it is hardly likely, according to present indications, that construction of a line to Charlotte will be undertaken before the other is finished.

New Interurban for Arkansas.

The Fort Smith, Van Buren & Interurban Light & Traction Co. has been organized at Van Buren, Ark., with $10,000 capital to build a line through Crawford, Franklin, Johnson, Madison, Boone and Searcy counties. T. A. Bailey, engineer, is said to have made a preliminary survey through Crawford county, and rights of way have been secured from Van Buren to Mulberry, Ark. Another report says that construction work has begun. The officers are: W. F. Keller, president; L. W. Burgett, vice-president; T. A. Bayley, secretary; S. A. Pernot, treasurer, and S. R. Chew, attorney. The other incorporators are J. L. Rea, W. F. Blocker of Fort Smith, Frank Woolum, L. F. Sherwood, R. A. Clarkson of Fort Smith, Henry Kibler, J. H. Keller, John Kibler, J. W. Keller and N. E. Waite.

Baker to Build More Line.

R. H. Baker, president of the Trinity & Brazos Valley Railway at Houston, Tex., will, according to a dispatch, resign on or about February 1 and devote his attention to some new railroad enterprise. He has not as yet declared his plans about building a new line or lines, and is only quoted as saying that his reason for resigning is that he has other and more important interests to look after, which he cannot attend to while president of the Trinity & Brazos Valley Railway.

Mr. Baker projected the Trinity & Brazos Valley line and accomplished its construction. It runs from Fort Worth and Dallas, Tex., to Houston and Galveston, and is now part of the Colorado & Southern system.

Yoakum's Work in Texas.

A dispatch from Fort Worth, Tex., says that the St. Louis & San Francisco Railroad will spend $15,000,000 for improvements this year. It is further said that an extension will be built from Ardmore, Okla., to Waurika and Lawton, Okla.; also, that the contemplated extension from Brady, Tex., to Menardville and another to Comfort will be constructed.

The St. Louis, Brownsville & Mexico Railroad, in which B. F. Yoakum of the 'Frisco is interested, will, it is furthermore reported, be extended to Tampico, Mexico, and the Marshall & East Texas Railway will build north to Paris, Tex., and south to Newton, Tex.

Willard President of B. & O.

Daniel Willard has just been elected president of the Baltimore & Ohio Railroad Co., succeeding Oscar G. Murray, resigned, and who has been elected chairman of the board, a new position. The change takes effect January 15.

Mr. Willard is now second vice-president of the Chicago, Burlington & Quincy Railway, and is regarded as a first-class operating official. Several years ago he was assistant general manager of the Baltimore & Ohio, which he left to go to the Erie Railroad, and from there he went to the Burlington system.

Sale of a Street Railway.

The Clarksville (Tenn.) Railway & Light Co., according to a dispatch, has been purchased by a syndicate represented by E. L. Fischer of Danville, Ill., which will improve the property and extend the line to New Providence and Dunbars Cave. For about a year the company has been in the hands of a receiver. The officers are: N. L. Carney, president; J. F. Gracey, secretary and treasurer; W. M. Case, manager. There is five and a half miles of track, beside the lighting and power plant and nine cars.

Rockingham to Gibson.

The Rockingham Railroad Co. is the name of a new corporation at Rockingham, N. C. Mayor W. N. Everett writes that it is proposed to build a line from there, "via all the cotton mills," to Gibson Station, about 20 miles, connecting there with the Atlantic Coast Line. The country is fairly level, and only one stream of any importance will have to be crossed. J. P. Leak is president and J. LeGrand Everett treasurer and secretary.

Improvements on the Santa Fe.

An officer of the Gulf, Colorado & Santa Fe Railway confirms the report of projected improvements. He says that the work contemplated on the San Angelo Branch consists of revision of grade and widening roadbed between Temple and Brownwood, for which $117,000 is authorized. There is also authorized another appropriation of $240,000 for ballasting this branch with rock for 55½ miles between the same points.

Railroad Notes.

Geo. D. Locke has been appointed vice-president and general manager of the Arkansas, Oklahoma & Western Railroad Co., with headquarters at Rogers, Ark.

A letter from Heavener, Okla., says that the Kansas City Southern Railroad is building there a 10-stall roundhouse, machine shops and 27 miles of switching, it being expected to make Heavener a division point.

The receivership of the Western Maryland Railroad being ended by the recent order of the court, the property, on January 1, was transferred to the Western Maryland Railway Co.

The Texas Railroad Commission has approved $3,000,000 of bonds of the proposed Galveston-Houston Electric Railway Co., and the proceeds will be used for building the line and for sharing in the cost of building the Galveston Causeway.

It is announced that control of the Roanoke Railway & Electric Co. and the Lynchburg Traction & Light Co. has been acquired by the American Railways Co., but that this transfer of control is only the result of an exchange of stock by shareholders in the two companies transferred. There will be no change, it is stated, in the officials of the company. The American Railways Co. controls similar properties in other cities.

A dispatch from San Antonio states that Frank Tomlinson of Big Springs, Tex., has purchased from D. J. Woodward of San Antonio 1000 acres of lignite lands in Robinson county. The property is located near the Calvary lignite mines and is said to be underlaid with a high-grade lignite deposit, which Mr. Tomlinson will probably develop. It is also thought that he will erect a large electric plant near the mines.

TEXTILES

[A complete record of new textile enterprises in the South will be found in the Construction Department.]

Correspondence relating to textile matters, especially to the cotton-mill interests of the South, and items of news about new mills or enlargements, special contracts for goods, market conditions, etc., are invited by the MANUFACTURERS' RECORD. We shall be glad to have such matters at all times, and also to have any general discussion relating to cotton matters.

Southern Knitting Mills.

There was continued activity during the third quarter of the year in the organization of knitting-mill companies. Twelve companies were announced, the total capitalization of 10 being $445,000. The list of companies follows:

Knitting Mills.

Name.	Address.	Capital stock.
Murbola Hosiery Co.	Burlington, N. C.	$50,000
D. J. Carpenter of Newton, N. C.	Canton, N. C.	50,000
Graham Hosiery Mill Co.	Graham, N. C.	25,000
Peerless Hosiery Co.	Tryon, N. C.	100,000
J. W. Blackwelder of Hickory, N. C.	In Oklahoma	.....
Palmetto Hosiery Co.	Jonesville, S. C.	75,000
Weiss Hosiery Mill	Cleveland, Tenn.	25,000
Lafollette Hosiery Mills	Lafollette, Tenn.	25,000
May Hosiery Mills	Nashville, Tenn.	60,000
Davis Hosiery Mills, East Chattanooga	Winchester, Tenn.	.....
Bell Hosiery Mills	Norfolk, Va.	10,000
Knitting Mills Corporation	Norfolk, Va.	25,000
		$445,000

The Glencoe Mills.

The Glencoe Cotton Mills of Columbia, S. C., has organized with T. H. Wannamaker of Orangeburg, S. C., president; G. M. Berry of Columbia, vice-president, and T. H. Wannamaker, Jr., of Orangeburg, secretary. This company was reported incorporated last week with a capital stock of $100,000 to install 5000 spindles for yarn manufacture.

Messrs. Shand & Lafaye of Columbia, S. C., have been engaged as engineers in charge, and will open both building and machinery bids in about 30 days. The mill will be driven by 225 electrical horsepower and have a daily output of about 7000 pounds of twines and warp, employing 100 operatives.

The Cotton Movement.

In his report for December 24 Col. Henry G. Hester, secretary of the New Orleans Cotton Exchange, shows that the amount of cotton brought into sight during 115 days of the present season was 6,864,798 bales, a decrease under the same period last year of 1,406,577 bales. The exports were 3,548,831 bales, a decrease of 776,150 bales. The takings were, by Northern spinners, 1,103,317 bales, a decrease of 284,256 bales; by Southern spinners, 888,381 bales, a decrease of 4041 bales.

The Waverly Cotton Mill.

The Waverly Cotton Mill Co. of Laurinburg, N. C., has completed its mill (previously detailed) and begun to manufacture. It has expended about $400,000 for a one-story 125x425-foot building, cross-compound condensing engine, four boilers of 600-horse-power capacity, 20,000 spindles, picking equipment, carding and drawing machinery, etc. Nos. 16 to 30 cotton yarns will be the product. R. C. Biberstein of Charlotte, N. C., was the architect. J. P. McRae is the company's president. The plant is driven by electricity generated by the boilers and engine mentioned.

Brander Cotton Mills Corporation.

The Brander Cotton Mills Corporation (mentioned last month as incorporated with a capital stock of $60,000) takes over Magnolia Mills No. 1 at Concord, N. C. This plant was reported recently as sold to L. W. Brander and associates, who had been operating it under lease. The new company contemplates adding 1000 spindles and 60 Jacquard looms to the 2000 spindles, etc., now in position. L. W. Brander is president.

To Manufacture Rope and Twine.

W. W. Cooper of Flowery Branch, Ga., is interested in the organization of a company to manufacture rope and twine, and he is prepared to consider estimates on the equipment of machinery.

Kentucky Wool Growers.

The Kentucky Wool Growers' Association of Louisville, Ky., has been incorporated by Messrs. J. W. Sidney, M. A. Clements, E. K. Renaker, Sidney Z. Clay, B. Macklin, A. H. Clore, L. L. Dorsey, W. L. Lawrence and C. F. Crecelius.

The Maxwell Hosiery Mill.

The Maxwell Hosiery Mill of Suffolk, Va., has been incorporated with a capital stock of $30,000. Its officers are: President, M. Maxwell; vice-president, J. C. Holladay; secretary-treasurer, H. E. Maxwell.

Silk Farm and Mill.

The Chamber of Commerce, Harry Burns, secretary, Macon, Ga., is negotiating with Dr. V. K. Osigian relative to the establishment of a silk farm and mill.

Textile Notes.

The Martin Hosiery Mill of Raleigh, N. C., has awarded contract for 100 additional knitting machines.

The Monroe (N. C.) Cotton Mills will install the electrical drive, instead of its present steam power. This company operates 8736 ring spindles, 152 broad looms, etc.

Florida Phosphate.

[Special Cor. Manufacturers' Record.]

Newberry, Fla., December 30.

The low prices governing phosphate of the higher grade (77 to 82), and known as the hard rock, has during the year 1909 decreased the export shipments by about 250,000 tons, and the miners of Florida, where the most of the hard rock is mined (principaly in the Newberry and Dunnellon districts), are holding out for better prices, and 1910 will find many miners idle rather than to sacrifice their raw material. At the prevailing prices of $4.50 to $5 per long ton there is a small profit in operating, but at this price the raw material brings nothing, and, in fact, is given away at a loss. There are now many plants idle in the mining districts of Florida, and unless better prices are offered for future contracts it will be almost absolutely necessary for many that are operating now to close down their plants, for most of the export shipments of 1909 have been made on past contracts that were made for future deliveries in 1907 and 1908.

F. C. N.

Coal shipments from Newport News during 1909 amounted to approximately 4,620,000 tons, an increase over the shipping of 1908 of about 980,000 tons, and is said to be more than double the shipping of any year in the port's history prior to 1904.

Of the total 10,984,000 cans of tomatoes put up in 1909, Maryland's output was 4,609,000 cans, the State leading all others in that particular.

GOOD ROADS

WEEK'S HIGHWAY RECORD.

Progress in Southern Road and Street Improvement.

[Full details of highway undertakings are given in the Construction Department.]

Bonds to Be Voted.

Mathiston, Miss.—City Council authorized issuance of $10,000 of bonds to construct sidewalks.

Winchester, Tenn.—Franklin county contemplates issuance of $100,000 of bonds for construction of pike roads.

Contracts Awarded.

Dallas, Tex.—Russell Realty Co. awarded $12,000 contract for constructing 47,670 square feet of four-foot sidewalks, with 11,917 linear feet of curbs and gutters.

Sumter, S. C.—City awarded contract for construction of concrete sidewalks.

Contracts to Be Awarded.

Dallas, Tex.—Municipal Commission has perfected plans for one mile of bitulithic paving on Elm street at a cost of $100,000.

Dothan, Ala.—City will open bids for paving various streets and about 50 miles of sidewalk.

Gordon, Ala.—Houston county will open proposals March 15 for construction of 51 miles of road.

Gulfport, Miss.—City will construct gravel road on East Beach street.

Homer, La.—City opens bids February 1 for four miles of concrete paving.

Portsmouth, Va.—Sixth and Seventh Ward Improvement Boards contemplate $47,000 expenditure for macadamizing center of High street; 60 feet wide.

FOR ROADS, $250,000.

Bonds Voted Is a Result of a Business Body's Activities.

[Special Cor. Manufacturers' Record.]

Board of Trade,
Denison, Tex., December 29.

On December 18 the Denison (Texas) Road District No. 1, by over the necessary two-thirds majority, voted to issue $250,000 in bonds for the purpose of constructing a 64-mile road system which had previously been outlined by the good-roads committee of the Denison Board of Trade. For the past four months the Denison Board of Trade, through its good-roads committee, has been carrying on an active, energetic campaign to secure votes in favor of the proposed bond issue. The law under which the road system will be constructed is known as the Grayson county road law, and it was put through the last session of the Texas Legislature through the efforts of the Denison Board of Trade. It provides that 50 or more residents of any defined political subdivision or subdivisions or any district described by metes and bounds may petition the County Commission to have such said district set apart as a road district, and that an election may be called for the purpose of voting a stated amount of bonds for the purpose of constructing and maintaining macadamized or graveled roads. The law provides that any municipality or part thereof may be included in the road district. The bonds of such said district are to run for 40 years, and a special provision of the law provides that one-fortieth of bonded indebtedness is to be retired each year. The value of this road law was recognized by the Texas Legislature and a general law modeled upon it was passed. Under this general law many districts have already voted bonds for the construction of macadamized road systems.

The Denison (Texas) Road District No. 1 includes a territory extending from four to seven miles in each direction from the city of Denison, which is about in the center of the district. In this district 10 principal county roads run direct into the city, and each and every one of these is to be macadamized to a point either on or near the extreme boundary of the district. The system is about 64 miles in extent, and of this amount 10¾ miles is within the city of Denison.

Denison, Tex., is a city with a population of about 20,000, and it has some improved streets, but it was decided to carry each one of the county roads as directly as possible to the main business street, so that a person driving in from the country with a load would not drop off into the mud after reaching the city limits. The assessed valuation in the road district totaled $8,369,900, and of this amount the outlying district was credited with only $603,000, the remainder of the valuation being distributed among the city property, banks and railroads. Thus it will be seen that the county paid only about one-thirtieth of the tax necessary to raise the bond and interest fund, and in the distribution of the road mileage it gets five-sixths of the improvement.

During December an active campaign was carried on which came to a successful close on the 18th, and the County Commission has already declared the election carried and has authorized an issuing of $250,000 in bonds. The work is to be done under the direction of the County Commissioners, and it is probable that they would be interested in hearing from road contractors, road engineers and others who have an interest in road work. As the bonds carry 4½ per cent. interest, it is probable that there will be some little demand for them, and it is expected that they may bring something above par. All bond houses desiring information concerning these bonds may secure it by writing the County Commissioners of Grayson county, Texas.

C. WILBUR COONS,
Secretary.

Palm Beach Bonds.

W. H. DaCamara, chairman Board of County Commissioners, Palm Beach county, Florida, writes to the MANUFACTURERS' RECORD:

"You may be interested to know that Palm Beach county voted $200,000 road-improvement bonds on the 14th of December. The bonds will be 30-year 4½ per cent. coupon, the entire amount derived therefrom to be expended on new roads and bridges. The former will include 30 miles of new road from West Palm Beach, the county-seat, to Stuart, on the St. Lucie River, at the extreme north end of the county, and among the bridges will be included one over the Loxahatchee River at Jupiter about 900 feet long, including steel draw. The vote was about 6 to 1 in favor of bonds, showing that the people of this section are alive to the importance of good roads. This road will be a link in what we hope will soon be a continuous hard-surfaced highway extending nearly 400 miles south from Jacksonville. Your 'Southern Good Roads Issue' of October 28 was full of valuable and interesting information, and should lend a great impetus to the cause. Let the good work go on."

Wants Location for Electric Plant.

R. A. Pratt, Monadnock Building, Chicago, writes the MANUFACTURERS' RECORD that he is prepared to establish an electric-light plant in the South. He has the machinery ready, and invites inquiries from municipal officials or investors who can be interested in the proposition. A city of 5000 to 8000 inhabitants is preferred.

It is estimated that the pig-iron production of Alabama in 1909 was 1,703,068 tons, an increase of more than 300,000 tons over 1907 and of about 15,000 tons over 1908.

LUMBER

[A complete record of new mills and building operations in the South will be found in the Construction Department.]

SOUTHERN BUILDING IN 1909.

Operations in Typical Cities Show Great Activity.

Southern and Southwestern building operations for 1909, as indicated by statistics which are available from a number of representative cities in these sections, show very gratifying increases in nearly all localities. This activity has been greatly stimulated by activity in industrial and commercial lines and will doubtless increase during 1910. In some sections there have been decreases as compared with previous years, owing principally to labor troubles and local conditions. A notable illustration of building growth is furnished by Atlanta, whose permits for the year numbered 4399, representing an estimated value of $5,551,951. As compared with 1908, these figures show an increase of 246 in the number of permits issued and $718,010 in valuation, and as compared with 1906, Atlanta's best previous year, they show an increase of about $400,000. Commenting upon the construction activity in Atlanta, the building inspector of that city is quoted as saying in effect that the character of buildings compares with the finest in the country, both from an architectural standpoint and the material used. For several years past all large buildings have been of steel construction, but added to these there are now the concrete structures. Thousands of dollars are being expended annually in homes just outside of the city limits, which are not considered in the office of the building inspector, consequently it is impossible to give an accurate idea of the improvements under way and which will ultimately become a part of the greater city. Building permits issued in Savannah during the year numbered 409, which is an increase of about 15 per cent. over the number issued in 1908, and an increase of about 20 per cent. in the value of the structures. In Birmingham a total of $2,329,002 was expended in building operations during the year, and while this is a decrease of approximately $250,000 as compared with 1908, more valuable residences were erected in 1909 than during any previous year. Homes costing from $10,000 to $15,000 have been numerous, while all classes of residences have been erected in various sections of the city. Several prominent buildings for which permits were issued in 1908 and completed during the past year include the Farley, Empire, Brown-Marx and other large structures. Among the important buildings planned and completed during 1909 are the *Age-Herald* Building, the Collins-Grocery Co.'s building, and four schoolhouses costing $160,000. Building activity in Montgomery has shown a marked increase in recent months, it being estimated that the value of operations for the year will reach $300,000.

Permits were issued in Jacksonville during 1909 to the number of 1057 for structures, having an estimated value of $2,310,025. As compared with operations for 1908, these figures show an increase of $234,525. Of the total expeditures during the year it is estimated that frame structures cost $1,453,131, while $856,894 was expended for brick, stone and concrete buildings. Building improvements in Tampa during the year were valued at $1,050,453.90, this expenditure representing a total of 1389 permits, of which 514 were for new buildings and the remainder for alterations and repairs.

Knoxville's building record for 1909 compares very favorably with those of previous years, amounting to $812,225, and as compared with 1908 shows an increase in the cost of construction of $221,452. Among the prominent structures for which permits were obtained during the year are a new high school, to cost $91,780; the Hotel Atkin, a five-story structure being erected by the Knoxville Leasing Co., at a cost of $75,000; store for Johnson & Reed, costing $32,562; brick stores for Daniel & P. J. Briscoe, costing $30,000, and other buildings. The expenditures in Chattanooga during the year for building construction is estimated at $1,077,851—a better record than for several previous years. The past year was marked by the erection of many buildings of a better character, including stores, office buildings, factories, churches, residences and other structures. Building operations have been unusually active in Memphis during the year and estimates place the cost of construction at approximately $4,000,000, an increase over 1908 of about $700,000.

Figures are not available for New Orleans, but it is estimated that operations in that city will show a good increase over 1908, when the value was estimated at $5,744,311. Like nearly all other important cities in the country, St. Louis' building record for 1909 shows a decided increase over that of 1908. There was a total of 9271 permits issued during the year, representing a valuation of $23,656,467. This record was exceeded only by that of 1906, when the value of operations was estimated at $30,000,000. Operations in Dallas for 1909 exceeded those of any previous year, with a total of 1691 permits, representing a valuation of $3,393,683. As compared with 1908, these figures show an increase of 223 in the number of permits issued and $1,087,585 in value. The value of buildings for which permits were issued in Houston during the year is estimated at $2,836,269, while the value of structures for which permits were issued in Galveston is estimated at nearly $2,000,000. An estimate of operations in El Paso during 1909 places the total valuation of structures for which permits were issued at $1,862,125. The best month of the year was April, when the value of operations was estimated at $441,336.

Operations in Oklahoma City for 1909 represent a valuation of $5,886,420, embracing a total of 1414 permits. This is an increase of 680 in the number of permits and $4,151,482 in the cost of construction as compared with 1908.

Among the Southern cities which have grown rapidly as centers of building operations is Richmond. The total of new construction, alterations and repairs, for which permits were issued during the past year, is estimated at $3,574,812. This is an increase over 1908 of $405,381. The valuation of buildings for which permits were issued in December is estimated at about $250,000, which is an increase over operations for December, 1908, of about $70,000. Statistics compiled in the building inspector's office at Norfolk show that during the year just ended there was a total of 807 permits issued, representing a cost of construction aggregating $2,456,953. As compared with 1908, these figures show an increase of 14 permits issued and a net increase in valuation of $356,092; of the total number of permits 528 were for residences, of which 223 were of brick and 305 of frame construction. Among the prominent buildings begun during the year was a high school, to cost $225,000; Y. M. C. A. Building, to cost $150,000; Christ Protestant Episcopal Church, to cost $125,000; Norfolk National Bank Building, to cost $75,000, and other structures. The total estimated

value of buildings for which permits were issued in Lynchburg during the year is estimated at $602,000, an increase over operations for 1908 of $39,000.

In Baltimore 1484 buildings were erected, at a cost of $9,785,698. To this may be added for alterations and repairs, electric and other instalations, elevators, heating systems, etc., about $3,000,000.

FOREIGN LETTERS

The MANUFACTURERS' RECORD is so widely read in foreign countries that we are in constant receipt of many letters from all parts of the world. Some of these letters indicate the disposition of foreigners to buy American goods, and are therefore of interest to our readers.

Prospects for Australian Trade.

F. R. Caldwell, 95 Victoria avenue, South Melbourne, Australia, writes the MANUFACTURERS' RECORD:

"I must compliment you upon having the most up-to-date magazine of its kind that I have ever had the pleasure of reading. Many firms mentioned therein could do a safe and lucrative business in this country. Australia is in its infancy, and though we have an area of nearly 3,000,000 square miles, our population is only 4,000,000. There are no climatic disadvantages, and the immigrant can begin a new life under most favorable conditions. The estimate of production in the Commonwealth has been set down at £167,446,000, or £39 17s 11d. per head, and of this sum, no less than £129,871,000 is credited to the primary producers, while only some £37,575,000 is placed to the value of Australian manufacturers. By the new tariff strenuous efforts are being made to foster Australian industries. During the last two years these efforts have met with success, as the people are desirous of patronizing their own industries, and in consequence the output of manufacturers has been materially increased. The tariff has also induced new industries to commence operations. This country has always suffered from dry seasons and droughts in certain parts, and the Government has employed an irrigation expert (Elwood Mead) from the United States. From what I can gather he is putting forward propositions that will greatly assist the small holdings. In the past a large proportion of the agricultural areas have been in the hands of large landowners or squatters, as they are called here. The Government is gradually buying up these holdings and subdividing them into small areas for settlers. The law in this country certainly makes for the protection of the people, but the investor of capital need be under no misgivings that his interests will not be safeguarded. As to the outlook for introducing American products in this country, should any of your readers desire an expression regarding their particular line I will be pleased to give all data possible. The United States should have a commercial representative in a country like this on the same lines as the National Association of Manufacturers. Manufacturers now depend upon data they receive through trade sources and perhaps by correspondence with business men. The latter often write with their own ends in view, and if they are not interested you cannot blame them for giving no more than a cursory resume of the subject. If the National Association of Manufacturers or the manufacturers of the United States had in this country a paid representative for placing agencies and seeing that the right persons handled them it would save any speculation as to whether the business was really in the right hands. A man who knows this country and the trade would know at once where best to place an American industry which it is desired should be represented. Not only could he go to the best people, but he would judge what firms were best capable of pushing the lines under consideration. Should you or your readers desire to go into any question with me I shall be pleased to assist in any way either through your well-known columns or by personal correspondence. I have a large crew of traveling men working all the States in this country and New Zealand to call upon stationers, hardware shops and general stores. If any of your subscribers who think they have articles which I might dispose of will drop me a line I could at once say whether it was suitable for the class of trade I cater to. I am always on the lookout for good novelties in any line. I am a native-born American."

Wanted for Turkey's Trade.

M. Carlo, Porta Galata, Omar Abed Han, third floor, 3d eme Etage, Constantinople, Turkey, sends the MANUFACTURERS' RECORD an announcement that "he has opened an agency for the sale of all kinds of products—automobiles, house furnishings, hardware, paper, machinery of every kind, paints, type, typewriters, lithograph equipment, etc. He asks for consignments."

NITRATES FROM AIR.

First Shipment on This Continent Made to Baltimore.

The first shipment of calcium cyanamid, or lime nitrogen, on the American continent was made from the plant at Niagara Falls, Ontario, on December 14, 1909. The shipment was 300 bags (26 tons), and was consigned to the office of the American Cyanamid Co. at Baltimore. The American Cyanamid Co. has moved its executive offices from Nashville, Tenn., to Baltimore. The Nashville office has been abolished, but the branch office in New York city will still be maintained.

This company operates an extensive plant at Niagara Falls on the Canadian side, and manufactures calcium cyanamid or lime nitrogen, obtaining the nitrogen required for this product from the air, through the agency of hydro-electric power, using 8000 horse-power for the purpose. The plant at Niagara Falls represents an investment of about $600,000. It is being built in units of 10,000 tons capacity. At present one of these units of 10,000 tons has been completed and is in operation. Other units will be pushed to completion until an annual capacity of 40,000 tons is reached. When this is accomplished the plant will still further be increased according to the demands for the product.

The company also operates a plant in Baltimore for reducing and refining all of its output. The product from the Niagara plant is shipped to the Baltimore plant in concentrated form, and is then reduced and refined to meet the requirements of the various fertilizer manufacturers. As the output of the Niagara plant increases the Baltimore plant will be enlarged to handle it.

Baltimore was selected for the executive offices and the location of the reducing and refining plant, because of this city's importance as a fertilizer manufacturing center in the country, and is also well located with regard to shipping facilities to the other leading fertilizer manufacturing points in the country. Regular shipments are now being made both from the Niagara and the Baltimore plants.

State Highway Commissioner J. St. Julien Wilson has published a map showing the great progress made in the past three years toward improved highways in Virginia.

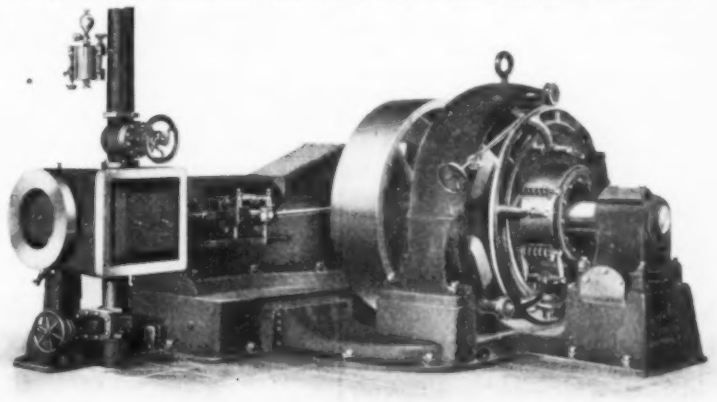
MECHANICAL

The Brownell Engine.

Two accompanying views refer to the Brownell side-crank self-oiling tandem compound engine, built by the Brownell Company of Dayton, Ohio. Referring to the construction of its engine, the company says:

"The frame is symmetrical and pleasing in appearance, is absolutely rigid under the most severe strains, and is of the side-crank pattern, with the driving pulley between the bearings. This pulley serves as a balance wheel and governor case. Too much stress cannot be put on this one important feature of side-crank construction, and the engineering public is beginning to realize that the center-crank engine has outlived its usefulness. Briefly stated, the advantages of the side-crank over the center-crank engine are as follows:

"First—Perfect shaft alignment can be maintained very easily with the side crank. This requisite to a first-class engine is next to impossible with the center crank.



THE BROWNELL SELF-OILING ENGINE.

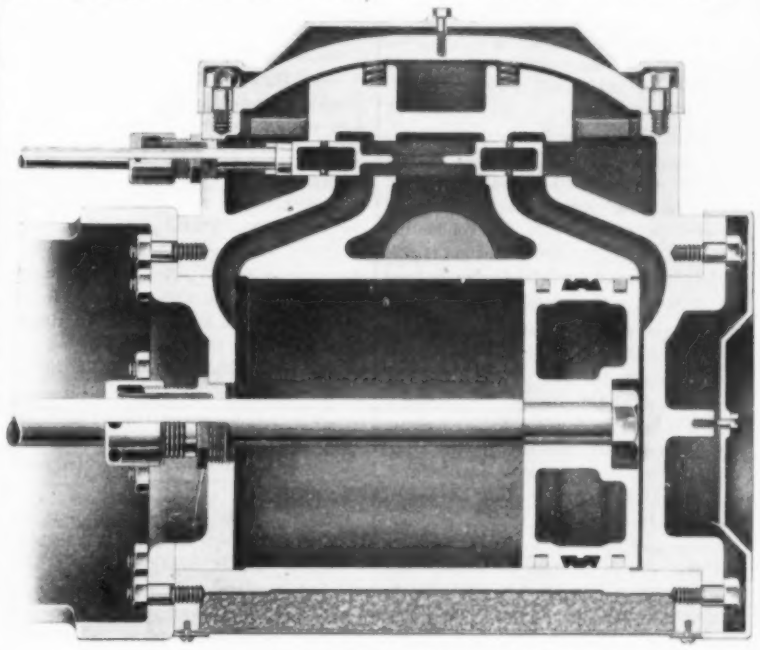
"Second—The strain on a belted machine is evenly distributed in the two bearings, while with the center crank, with its overhanging pulley, one bearing must take care of the entire pull.

"Third—The details which need the attention of the engineer are more accessible in the side-crank type.

"Fourth—A reduction in the floor space, friction and repairs, especially in the direct-connected machines, due to the use of two bearings instead of three, which become necessary with the center-crank engine, making shaft alignment even more uncertain and difficult than with the belted unit.

"Fifth—There is no comparison in strength between the shaft and crank of the two styles. It is not surprising to learn of a shaft failure in the center-crank engine. In our long experience we have yet to learn of a shaft failure on a side-crank engine.

"The governor on all of these engines is the latest improved design of the well-known Rites' inertia type, the most sensitive and efficient regulating device ever applied to a steam engine. This governor is used very extensively by other builders also, and needs no introduction to the engineering public. It combines the advantages of the centrifugal with those of the inertia styles, and thereby takes care of all changes in load whether gradual or sudden. This governor consists essentially of a single weighted arm swinging on a pivot pin. Fastened to this arm is the eccentric which drives the valve. As the weight arm assumes different positions, due to changes in load, the center of eccentric is brought nearer to or farther from the shaft center, thereby regulating travel of valve and admission of steam as the load demands. There is only one bearing, and this is equipped with a removable bronze bushing. This fact insures a minimum amount of friction, a good bearing surface, and a very simple and efficient governor.



VALVE AND CYLINDER OF BROWNELL ENGINE.

"Probably no part of the steam engine has received more thought and attention from the designers than the valve, and justly so, too. Without a valve which will fulfill a number of difficult requirements, no engine, however good in other

respects, can attain the success which the manufacturer desires for it. In the first place, the valve must be balanced, otherwise too much power is wasted in driving it. In an attempt to use an unbalanced valve some builders have made a short valve and reduced the stroke to reduce the pressure against the seat. The first case necessitates an increase in length of ports, and consequently in amount of clearance; the second restricts the port opening, thereby spoiling the correct steam distribution in the cylinder.

"In the second place, the valve must be so constructed that it is steamtight and remain so during long periods of operation. When adjustment is finally necessary, it must be simple and admit of being made with the facilities which the average engineer has at hand.

"In the third place, the valve must be multiported, otherwise the port opening with ordinary cut-off will be so small as wire-draw the steam, similar to the throttling governed engine, thereby defeating the object and advantage of the automatic engine.

"The valve used in the Brownell automatic engine more nearly fills the requirements of the perfect valve than any with which we are familiar. The valve is a rectangular ported casting, finished on both sides to an exact thickness. This valve works between the valve seat and a heavy pressure plate, which removes the pressure from its back, making it perfectly balanced. The weight of the valve causes it to wear down slightly, but this wear can cause no leak of steam, as is the case with the piston valve. Our construction necessarily requires the greatest skill and accuracy in its production, making it more expensive than other forms. Its great advantages, however, fully justify its increased cost. Provision is also made for relief in case of a charge of water getting into cylinder, thereby preventing an accident.

"The cylinder is cast from a special mixture producing a close-grained iron, which takes a high polish and which has great tensile strength. The cylinder is bolted direct to engine frame, the end of the frame forming the front cylinder head, thus insuring perfect alignment. The cylinder is covered with a neat sheet-steel jacket and the space between jacket and cylinder is packed with non-conducting material. In the tandem compound engine all joints between frame and cylinder head are ground metal-to-metal joints.

"The piston is a single casting, cored very thin and braced with ribs to make it strong enough for any legitimate strain. In the case of the 10 and 11x12 simple engine it is pressed on the rod by hydraulic pressure and the rod riveted over, while on the larger sizes it is pressed on and held in place by a nut on the end of the rod. In all sizes of the tandem compound engine the head is screwed onto the rod and held in position by a nut. The wearing surface is very liberal and the casting very light, thus reducing the wear in cylinder to a minimum. It is packed by two elastic cast-iron rings, one near each end, and another ring of anti-fraction metal is placed in the center.

"We believe no detail of our engine to be more satisfactory than the crosshead. It is circular to fit bored guides and readily adjusts itself to the crank pin, and must remain so. It is fitted with solid bronze adjustable shoes both top and bottom, and only a moment's work is necessary to bring it central with the guides. There is no dissembling of parts and no packing up with liners to make the adjustment, a fact that will be appreciated by any engineer who has had experience with other types. The piston rod is screwed into the crosshead and locked with nut.

"The conecting rod is a solid steel forging, with ends mortised to receive boxes. Adjustment is made by wedges, and both boxes are made to move in the same direction. By this adjustment the length of rod between centers of pins remains unchanged by wear. The boxes at crosshead end are bronze and at crank end are babbitt lined. Experience has proved this to be the most satisfactory construction for high-speed engines. The advantages of the simple and highly mechanical construction of this rod can be readily seen and appreciated when compared with the 'trappy' arrangement of straps, bolts and gibs usually employed.

"The idea of self-lubrication in high-speed engine practice is now considered among engineers of repute to be an absolute necessity. By its adoption the life of the wearing parts is prolonged, the friction is reduced to a minimum by the constant supply of oil, economy in oil is effected, cleanliness is easily maintained and smooth and quiet operation through long periods is possible without depending upon the care and attention of the engineer in charge.

"Automatic lubrication, like all other practices, to be efficient and reliable, must of necessity be simple, avoiding long pipes, tanks, etc. With the "Brownell" high-speed engine the system employed is simplicity itself. The oil is poured into the engine frame so that the periphery of the crank disc is in contact with the oil. As the engine is set in motion and the crank revolves, oil is thrown by centrifugal force in great quantities back upon the guides and cross-head and into small reservoirs in the hood and engine frame, from whence it is carried to the main bearing, eccentric and guide bar through short, direct tubes. It is then taken back to the main reservoir in frame by gravity and used over and over again. The flow of oil to main bearing, eccentric and valve rod guides is always visible to the operator, and the parts which are inclosed are always in a deluge of oil. There is no supposition and no possible chance for any of the working parts to run dry.

"One of the attractive features used in connection with this system of lubrication is the hood which covers the crank disc. It is constructed of the best steel, furnished with handles and angles, which are rivetted to the sides and end where connection is made with the engine frame. Special attention is given to the fitting of these angles so that there is no leak of oil from the hood to the outside of the frame. Being constructed of light material, it is easy to remove and replace when inspection is desired, at the same time adding finish and neatness by its handsome appearance.

"A substantial sub-base of neat appearance will be furnished with all high-speed engines. It gives the engine a more finished appearance and a much more rigid foundation than when set on concrete or stone, and makes the machine entirely self-contained.

"The out-board bearing is similar in construction to the main bearing, but differs from it in the maner of lubrication. An oil reservoir is cast in the box and the oil is carried from the reservoir to the shaft by means of two chains, thus insuring direct lubrication when engine is in motion. One of the special features of our engine is the adjustable out-board bearing, something which far surpasses anything which has been offered on any other make of engine now on the market. Adjustment can be made in any direction by means of wedges and set-screws, which assure perfect alignment. Between the bearing and its cap are provided thin metal liners, which afford a ready method of making adjustment when it becomes necessary.

"All sizes of the tandem compound engines are equipped with a neat pedestal under distance piece between cylinders, which serves as a support to take the strain off frame. A similar support is placed at rear end of cylinders of simple engines from 14x16 to 22x20 inclusive. This support is not bolted rigidly to the cylinder, but is left loose to allow the cylinder to expand and contract freely.

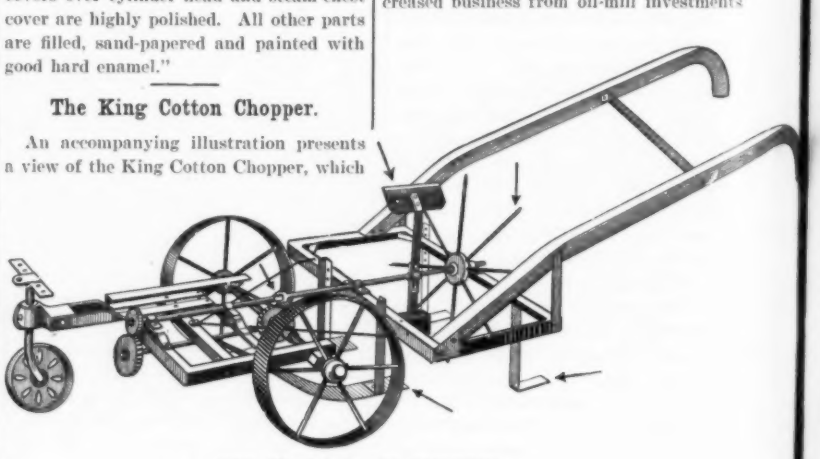
"All engines, after erection, are carefully tested under steam with brake and indicator, the object being to get all parts of the engine properly adjusted, to get the valve correctly set and to secure the desired speed and regulation with varying loads. While the conditions of this test are made more severe than is likely to occur in actual practice, no engine is allowed to leave the testing-room until the operation is satisfactory in every detail.

"Each engine is equipped with throttle valve, force feed cylinder lubricator, automatic cylinder drain cocks, set of wrenches, foundation bolts and plates. Template is furnished only when specially specified.

"The valve rod, piston rod, eccentric rod, cylinder jacket-bands, flanges on false covers over cylinder head and steam-chest cover are highly polished. All other parts are filled, sand-papered and painted with good hard enamel."

The King Cotton Chopper.

An accompanying illustration presents a view of the King Cotton Chopper, which is manufactured by the King Weeder Co. of Richmond, Va. The machine is described as follows:



THE KING COTTON CHOPPER.

"This implement chops the cotton to a stand. Takes out all grass, scratches lightly around the stalks left standing, and leaves the row of cotton finished—chopped and sided all at one go of a man and a horse. One horse and a man can finish from six to eight acres daily, and without the use of hand-hoe work.

"The machine is of simple construction, easily understood, and may be operated by any laborer. The hoe frame rests on slides that fit snugly to the row, and automatically adjusts itself to any unevenness of the top of the bed. The hoe blade, guided by the slides, cuts through the row, shaving off only the top, half or one inch drop accordingly, as desired; the hoe can't dig, it is held to cut so deep and no more, just as the bit of a plane is set to cut only a given depth. This blade cuts out balks, leaving a three or four inch space untouched, and on this space is left the cotton stalks. The spaces may be any distance apart.

"The weeding wheel revolves and cultivates the whole of the top surface of the row, cleaning out all grass and weeds from the untouched spaces and thinning the cotton to a stand. A siding device follows the weeder wheel and sides up the row, leaving the work finished and complete.

"The machine straddles the row, the hoe frame being jointed to the running gear in such a manner that the driver can guide it, keeping this part of the machine immediately over the row of cotton. This arrangement makes it easy to follow a crooked row and to protect a stalk of cotton off to one side of the bed. The driver need not pay attention to the horse other than to see that the frame straddles the row and the automatic adjustment compels the hoe and weeder wheel to fit the row exactly and cut evenly and smoothly.

"The machine will operate successfully when the rows are crooked, on high or low beds, when the field is reasonably free from stumps and stone.

"The action of the machine is to cut through the row, leaving a 5-inch space untouched, on this space being left the cotton plants remaining for a stand. A weeding wheel cuts lightly through these untouched spaces, thinning out the plants and cleaning out every particle of grass. The whole surface of the row is thoroughly mulched (gently stirred), leaving the earth in a thoroughly pulverized condition, so the work of the chopper is superior to the work usually accomplished by hoe hands."

Oil Mills and Ice Factories in Combination.

One of the greatest possibilities of increased business from oil-mill investments in the South through the operation of ice factories in connection with these mills seems to have been entirely overlooked until recent years, during which time a few of the mills have installed ice machines in connection with their other machinery.

The average oil mill has an investment of from $40,000 to $75,000. On account of being able to work up all available seed in five or six months, from October 1 to April 1, they are closed down for the balance of the year, and thus their investment is at work only one-half of the time. Moreover, they must bear the expense of paying a superintendent and watchman during the entire period.

No other industry having its good and bad seasons is busier during the oil mill dull season or duller during the oil mill busy season than the ice manufacturers, and the additional investment necessary to combine an ice manufacturing plant with the average oil mill is comparatively small, and especially so when it is considered that by so doing a 12 months' instead of a six months' revenue may be obtained. The oil-mill superintendents can with very little investigation operate an ice machine as well as an oil mill, and a fireman can be employed at about the same expense as a watchman. Recently quite a few of the mills have demonstrated the practicability of this combination, and reports show that a good many others are investigating it.

Construction Department

TO OUR READERS!

In order to understand and follow up properly the Construction Department items, please bear in mind the following statements:

EXPLANATORY

The MANUFACTURERS' RECORD seeks to verify every item reported in its Construction Department by a full investigation and complete correspondence with everyone interested. But it is often impossible to do this before the item must be printed, or else lose its value as news. In such cases the statements are always made as "rumored" or "reported," and not as positive items of news. If our readers will note these points they will see the necessity of the discrimination, and they will avoid accepting as a certainty matters that we explicitly state are "reports" or "rumors" only. We are always glad to have our attention called to any errors that may occur.

In correspondence relating to matters reported in this paper, it will be of advantage to all concerned if it is stated that the information was gained from the MANUFACTURERS' RECORD.

ADDRESS FULLY

To insure prompt delivery of communications about items reported in these columns, the name of one or more incorporators of a newly incorporated enterprise should be shown on the letter addressed to that town, or to the town of the individual sought, as may be shown in the item, as sometimes a communication merely addressed in the corporate or official name of a newly established company or enterprise cannot be delivered by the postmaster. This will help to insure prompt delivery of your communication although it is inevitable that some failures on the part of the postal authorities to deliver mail to new concerns will occur.

WRITE DIRECT

It is suggested to advertisers and readers that in communicating with individuals and firms reported in these columns, a letter written specifically about the matter reported is likely to receive quicker and surer attention than a mere circular.

The Daily Bulletin of the Manufacturers' Record is published every business day in the year for the purpose of giving the earliest possible news in regard to new industrial, railroad and financial enterprises organized in the South. It is invaluable to contractors, manufacturers, engineers and all others who want to get in touch at the earliest moment with new undertakings or the enlargement of established enterprises. The subscription price is $25 a year. All advertising contracts in the Manufacturers' Record extending over a period of three months include a subscription for the length of time of the contract to the Daily Bulletin.

BRIDGES, CULVERTS, VIADUCTS

Fla., Jupiter.—Bridge recently noted to be erected by Palm Beach county over Loxahatchee River at Jupiter will be 900 feet in length, including steel draw; W. H. DaCamara, chairman Board of County Commissioners. (This bridge and others to be erected in connection with construction of hard-surfaced or macadamized roads through county; as previously stated, $200,000 to be expended for roads and bridges.)

Fla., St. Petersburg.—Hillsboro county will construct bridge across Long Bayou near Johns Pass; estimated cost of structure constructed of concrete piling, $10,000; bids invited; W. W. Whitehurst, County Commissioner; George Fuchs, County Engineer.

Ga., Columbus. — Bridges and Wharves Committee introduced ordinance in City Council calling for bond election to decide issuance of $100,000 of bonds for construction of proposed concrete or steel bridge across river at Dillingham St.; W. C. Campbell, City Engineer.

Tenn., Chattanooga. — Board of Public Works decided to request railroad companies to repair viaduct at cost of $16,000, in accordance with plan submitted by City Engineer; estimated cost of new structure, $130,000; Robert Hooke, City Engineer.

Tex., Altair.—San Antonio & Aransas Pass Railway Co., Hans Helland, superintendent maintenance of way, Yoakum, Tex., contemplates construction of bridge over Colorado River; 275 feet truss span; two plate girder spans; approaches 40 and 60 feet long, respectively, supported by concrete piers; embankments to the bridge will contain about 35,000 cubic yards earth.

Tex., San Antonio.—Bexar county now inviting bids for construction of proposed concrete arch bridge; two 110-foot spans and two 30-foot spans, carrying 18-foot roadway; contain 850 cubic yards reinforced concrete, 1600 cubic yards rubble concrete, etc; estimated cost reported as $22,000; plans on file; Thos. E. Ramsay, County Auditor; lately mentioned. (See "Machinery Wanted.")

CANNING AND PACKING PLANTS

Ala., Birmingham.—Tennessee Packing & Stockyards Co. incorporated with $5000 capital stock by J. A. Harkinson, Harry Anderson, T. M. Forde and others.

Mo., Harrisonville.—Detter Canning Co., C. E. Detter, manager (recently reported incorporated), will establish canning factory with daily capacity of about 15,000 cans; will erect 40x140-foot building; construction not before summer.

Tex., Bay City.—B. E. Norvell, J. W. Macgill and A. D. Hensley are interested in establishment of cannery.

CLAYWORKING PLANTS

Ala., Fort Payne.—Ladd-Birchy Brick Co. (now in readiness to operate, with $200,000 invested in buildings, machinery and clay mines) will enlarge plant by building two additional down-draft brick kilns and two muffle terra-cotta kilns for enamelware; Chas. Birchy in charge of manufacturing.

Ky., Louisville — Brick and Tile. — Unit Brick & Tile Co. incorporated with $50,000 capital stock by Dennis H. Long, S. D. Adkisson and D. Price Vanarsdall.

N. C., Charlotte—Brick and Tile.—Carolina Brick & Tile Co. incorporated with $150,000 capital stock by Paul Chatham, F. McM. Sawyer and W. S. Lee.

Tex., Saspamco — Brick. — San Antonio Sewer Pipe Co., Maverick Bank Bldg., San Antonio, Tex., will shortly award contract for erection of two circular kilns.

Ky., Mayfield—Brick.—Standard Brick Co. incorporated with $10,000 capital stock by O. S. Waggoner, X. B. Wickersham and G. R. Allen.

COAL MINES AND COKE OVENS

Ky., Cary.—Left Fork Coal Co., B. W. Whitfield, president, recently noted to have purchased 300 acres of coal land (under Pineville) for development, will have output of 7000 tons per month.

Ky., Pine Hill.—B. R. Hutchcraft and A. J. August of Lexington, Ky., will organize company with large capital to develop coal and cement material deposits.

La., New Orleans.—E. F. Ulmer Coal Co. organized with $5000 capital stock by E. F. Ulmer, P. H. Comfort and E. F. Pilie.

Tex., Robinson County.—Frank Tomlinson, Big Springs, Tex., purchased 1000 acres of lignite coal lands for development.

Va., Norton. — E. H. Ould, Middlesboro, Ky., purchased interest in Huettel Coal & Coke Co.; property comprises 654 acres; proposes to build coke ovens and improve mining facilities; present capacity, about 100 tons daily, to be increased; plans not fully matured; will use electric or compressed-air machinery; E. H. Ould, president; George Huettel, vice-president; George Huettel, manager. (See "Machinery Wanted.")

Va., Richmond.—Atlantic Ice & Coal Corporation incorporated with $8,000,000 capital stock to mine coal, etc.; Ernest Woodruff, Woodruff, Atlanta, Ga., president. (See "Ice and Cold-Storage Plants.")

Va., Richlands.—Marshall Righter, Philadelphia, Pa., and George W. St. Clair, Tazewell, Va., are driving headings preparatory to developing coal property.

W. Va., Boggs.—Edgewood Coal Co. (W. T. Hughes, Moundsville, W. Va.; W. B. Rede, Cameron, W. Va., and others) purchased 800 acres coal land and will develop.

W. Va., Ansted.—Signal Knob Coal Co. incorporated with $10,000 capital stock by S. H. Croft, W. H. Evans, M. Agnew and others.

W. Va., Berwind.—New River & Pocahontas Consolidated Coal Co., Betz Bldg., Philadelphia, Pa., will develop additional coal mines at mouth of War Creek.

W. Va., Bluefield. — West Virginia-Pocahontas Coal Co., William Leckie, general manager, will develop mine No. 2; capacity of mines Nos. 1 and 2 is expected to be between 700 and 800 tons daily.

W. Va., Clarksburg.—Jackson Land & Mining Co. incorporated with $60,000 capital stock by Caroline M. Jackson of Clarksburg, M. J. Stiles, S. B. Stiles, J. M. Jackson and K. T. Jackson, all of Parkersburg, W. Va.

W. Va., Fairmont. — Farmington Coal & Coke Co. (recently reported incorporated with $300,000 capital stock by B. P. Porter, Cleveland, O., and others) has acquired 1000 acres of coal land for development.

W. Va., Fairmont.—Coal Run Fuel Co. incorporated with $5000 capital stock by J. E. Morgan, Martin J. Joyce, Burt West and others.

W. Va., Raleigh and Wyoming Counties.—P. J. Millet, Paris, Ky., has, it is reported, purchased 2000 acres of coal lands in Raleigh and Wyoming counties.

W. Va., Villa.—Villa Coal Mining Co. incorporated with $5000 capital stock by F. M. Wattles and Fred Wattles, Robyville, Ohio; E. W. Brightwell, George H. Belsches and A. P. Hudson of Charleston, W. Va.

CONCRETE AND CEMENT PLANTS

Tex., Galveston — Concrete Piling. — Gulf Concrete Co. incorporated with $100,000 capital stock by Alf Bryde and Daniel Wallis; will manufacture concrete piling.

COTTON COMPRESSES AND GINS

S. C., Fairmont.—Union Gin & Mill Co. will operate cotton-oil mill in connection with Union Ginning Co.

S. C., Charleston.—South Carolina Warehouse Corporation will install 2500-ton compress in connection with warehouse and compressing facilities previously announced. (See "Warehouses.")

Tex., Rockwall.—McLendon Gin Co. incorporated with $6000 capital stock by W. C. Bishop, J. J. Austin and J. E. Wilson.

Tex., Rockwall.—Millwood Gin Co. increased capital stock from $2500 to $3000.

DRAINAGE AND IRRIGATION SYSTEMS

Ark., Obear. — Gregg & Houghton Land Co., Jonesboro, Ark., is proceeding with arrangements for irrigation of rice lands near Obear; two 50-horse-power boilers, two 40-horse-power engines, 75-horse-power boiler and 60-horse-power engine have been received and will be installed; derricks for wells have been erected and additional well-drilling equipment will soon be received; expenditure about $20,000.

Fla., Sanborn.—Capt. W. L. Seeley, engineer in charge, proceeding with survey for proposed inland canal to Ocklockonee River, 127 miles.

Fla., West Palm Beach.—Okeechobee Improvement Co., J. R. Anthony, president (recently reported incorporated under "Land Developments"), proposes to construct canal in connection with reclaiming Everglades of Florida, open adjacent lands for settlement, construct automobile road from Palm Beach to Lake Okeechobee on one side of canal and prepare other side for roadbed for branch of Florida East Coast Railway; company submitted bid to Internal Improvement Board for construction of canal in accordance with advertisement, but as yet board has taken no action.

ELECTRIC-LIGHT AND POWER PLANTS

Ga., Lavonia.—City awarded contract for erection of electric-light plant; will develop upper shoals of Shoals Creek for power. Address The Mayor.

Ky., Louisville.—Louisville Lighting Co., F. M. Sackett, president, will provide for expenditure of $1,500,000 for future enlargement and improvement of facilities; will expend $200,000 for new machinery in plant at Broadway and 14th St.

La., Clinton.—Board of Mayor and Aldermen authorized purchase of Clinton Oil Mill Co.'s electric-light plant for $13,000, and will employ electrical engineer to superintend removal and erection of machinery in new building near present location; John Levy, Mayor.

La., New Orleans.—New Orleans Railway & Light Co., 317 Baronne St., awarded contract to Jefferson Construction Co., Perrin Bldg., New Orleans, for erection of substation and emergency house; 154 feet 8 inches by 53 feet 8 inches; substation to be fireproof construction; emergency house mill construction; Otis elevator; cost $22,000; plans by company's superintendent of power; equipment supplied.

Md., Salisbury.—Sussex Light & Power Co. incorporated with $50,000 capital stock by William H. Cooper, Elizabeth D. Cooper, Jesse D. Price and Mark Cooper.

Md., Elkton.—City Council will probably issue bonds for construction of electric-light plant. Address The Mayor.

Okla., El Reno.—Utility Gas & Electric Co. (recently noted incorporated with $1,000,000 capital stock by H. H. Stephens and others) takes El Reno Gas & Electric Co.; will not make any additions at present.

Okla., Tishomingo.—City contemplates installation of electric plant to supply light, power and heat; water-power; 1000 to 1200 incandescent or 15 arc lights; about 15 miles of wire; W. H. Bingham, president Board of Trustees; also contemplates installing filter at dam. (See "Machinery Wanted.")

S. C., Greers.—City awarded contract to A. H. Miller of Greers to light streets and public buildings; electricity will be furnished by Southern Power Co. of Charlotte, N. C.

Tenn., Clarksville.—Company, represented by E. L. Fisher, Danville, Ill., purchased Clarksville Electric Light & Power Co.'s plant and will improve.

Tex., Houston.—Houston Lighting & Power Co. increased capital stock from $1,000,000 to $1,500,000; various improvements are contemplated, including installation of additional machinery in power-house and placing wires in fire district under ground; for latter work $100,000 was appropriated some time ago.

Tex., Hoyt.—D. C. Earnest, president Consumers' Lignite Co. (not Producers' Lignite Co., as lately stated), Dr. J. Conner Chisholm and Elbert A. Harvey, all of Dallas, Tex., will endeavor to promote organization of company to install power plant at Hoyt lignite mines for transmitting electricity to Dallas, Fort Worth, Terrell and intermediate points; distance from mines to Dallas is about 74 miles.

Va., Pennington Gap.—Monarch Coal Co. will rebuild power-house burned at loss of $6000.

Va., Radford.—Virginia Power Co. incorporated with capital stock of $50,000 by J. J. Mott of Radford, N. B. McCandless and J. D. Norwood of Salisbury, N. C.

Va., Richmond.—Atlantic Ice & Coal Corporation, Ernest Woodruff, Atlanta, Ga., president, includes in charter privileges construction of electric and power plants. (See "Ice and Cold-Storage Plants.")

W. Va., Ronceverte.—Ronceverte Milling Co., incorporated by Oscar A. Price and others, includes in charter privileges construction of dam across Greenbrier River, building of electric and water-power plants, etc. (See "Flour, Feed and Meal Mills.")

FLOUR, FEED AND MEAL MILLS

Ala., St. Stephens.—W. E. Kimbrough and others will not establish flour mill. (Recent report incorrect.)

Mo., Washington.—Grant Tower Milling Co. incorporated with $30,000 capital stock by Gustav H. Hoemann, John H. Stratman and Louis Klingsick.

Tex., Coleman. — Coleman Flouring Mill Co. reorganized with $20,000 capital stock; will install new machinery and establish flour mill.

Tex., Sherman.—W. E. Welch, Oklahoma City, Okla., representing Consolidated Alfalfa Milling Co., is interested in establishment of alfalfa mill; capacity 100 tons daily; will equip with Rowland machinery for converting green alfalfa into meal.

FOUNDRY AND MACHINE PLANTS

Ala., Anniston—Foundry.—Anniston Foundry & Machine Co., E. L. Turner, president, contemplates doubling capacity of plant.

Md., Baltimore—Corks and Seals.—Crown Cork & Seal Co., Guilford Ave. and Oliver St., awarded contract to D. M. Andrews Co., Mt. Vernon Ave. and 26th St., Baltimore, for foundry building recently mentioned; one story; brick and steel; 42.4x68.7 feet; cost $7900; plans by C. M. Anderson, 324 North Charles St., Baltimore.

Mo., Joplin—Machinery. — Martin Machinery Co. incorporated with $15,000 capital stock by E. A. Martin, C. G. Boyer and R. H. Lanyon.

Okla., Tulsa—Foundry.—American Foundry Co. incorporated with $10,000 capital stock by W. A. Robbins, Leonard Fingul and D. S. Thompson.

Tenn., Chattanooga — Wire-stitching Machines.—Saranac Machine Co., St. Joseph, Mich., contemplates establishment of plant for manufacturing wire-stitching machines.

W. Va., Parkersburg — Machine Shop. — Spence, Smith & Kootz Company incorporated with $50,000 capital stock by H. M. Spence, W. S. Smith, Albert Kootz and others.

W. Va., Ronceverte.—Ronceverte Milling Co. incorporated with $50,000 capital stock by Oscar A. Price, James R. Johnson, James Winkler, Jr., and others; to establish flour, feed and meal mill, construct dam across Greenbrier River, build electric plant, etc.

GAS AND OIL DEVELOPMENTS

Mo., Creighton.—Creighton Oil, Gas & Developing Co. incorporated with $5000 capital stock by J. Christmann, B. A. Biggerstaff, Victor Swanson and others.

W. Va., Charleston.—Sergeant Oil & Gas Co. incorporated with $40,000 capital stock by C. W. Swisher, S. V. Matthews, M. B. Hawks and others.

W. Va., Clarksburg.—Williams Oil & Gas Co. incorporated with $10,000 capital stock by H. M. Heavener, J. S. Smith, W. Guy Tetrick and others.

W. Va., Grafton.—Tygard Oil & Gas Co. incorporated with $10,000 capital stock by U. B. Williams, B. L. Holverstott, W. C. Kinney and others.

W. Va., Pennsboro.—Lambert Oil & Gas Co. incorporated with $20,000 capital stock by E. J. McKinley, J. A. Leggett, J. H. Wilson and others.

ICE AND COLD-STORAGE PLANTS

Ga., Elberton.—Thos. M. Swift, Jr., contemplates building ice and cold-storage plant of 20 to 25 tons capacity. (See "Machinery Wanted.")

Tex., Austin.—T. B. Walker Manufacturing Co. will erect additional building (adjoining cannery) for cold-storage plant; also proposes erection of slaughter-house with initial killing capacity of 25 beeves daily; cost of improvements, $50,000.

Tex., Houston.—Houston Ice & Brewing Co. will erect additional cold-storage plant; four stories; 56x50 feet; cost $30,000; plans by Cooke & Co., Houston.

Tex., Marble Falls.—Marble Falls Ice & Cold Storage Co., W. H. Hoag, manager (recently noted to establish plant), will erect 24x30-foot concrete building; construction by W. H. Hoag; daily capacity, 15 tons ice and cold storage; machinery bids now open. (See "Machinery Wanted.")

Va., Richmond.—Atlantic Ice & Coal Corporation incorporated with $8,000,000 capital stock; Ernest Woodruff, president; W. J. Rushton and W. E. Chapin, vice-presidents; J. C. Gentry, secretary-treasurer, all of Atlanta, Ga.; will establish ice and cold-storage, electric-light and power plants, and mine coal.

IRON AND STEEL PLANTS

Ala., Attalla—Iron Furnace.—Eagle Iron Furnace Co. incorporated with $60,000 capital stock; has made repairs to iron furnace and will soon blow in; Charles A. Lyerly, Chattanooga, Tenn., is president and treasurer; W. S. Shelow of Attalla, vice-president; F. Giddings, Chattanooga, Tenn., secretary. (Mr. Lyerly and associates recently reported as having leased Eagle Iron Co.'s furnace.)

Tex., Houston—Iron Works.—Grant Iron Works will enlarge plant; expenditure, $35,000.

Tex., Houston—Structural Steel.—Houston Structural Steel Co. will double size of plant and install additional machinery to treble capacity; present building is about 60x100 feet and is surrounded by five acres for building and storage purposes; estimated expenditure, $35,000.

LAND DEVELOPMENTS

Ala., Foley.—William B. Gray, Chicago, Ill., purchased 17,000 acres of land in Baldwin county, near Foley, for colonization; said to be in connection with Ohio-Alabama Land Co., recently reported incorporated at Bay Minette, Ala.

Ga., Columbus. — M. Reynolds Flournoy and associates purchased 12 acres of land and will develop as residential section; will lay out streets, subdivide into building lots, install necessary drainage, etc.

Ky., Louisville.—Bernstein Realty Co. incorporated with $30,000 capital stock by William Taradash, Jacob Bernstein and Abe Bernstein.

La., Abita Springs.—Abita Springs Land & Improvement Co. will develop about 500 acres of land into residential section; will construct roads and streets and make other improvements.

Mo., St. Genevieve. — Kohrn & Hoffman Land Co. incorporated with $30,000 capital stock by Henri I. Kohrn, Mena M. Kohrn, M. W. Hoffman and others.

Okla., Shawnee. — Shawnee Development Co. incorporated with $100,000 capital stock by J. M. Aydelotte, J. D. Roebuck, J. W. Rubey and others.

S. C., Greeleyville.—Santee Land Co. incorporated with $10,000 capital stock.

S. C., Kingstree.—Williamsburg Land Co. incorporated with $30,000 capital stock; R. L. Montague, president; J. A. Kelley, vice-president; W. C. Claiborne, secretary; P. S. Gourdin, treasurer.

Tex., Beaumont.—Beaumont Land & Building Co. incorporated with $300,000 capital stock by W. C. Gray, George W. Carroll, Charles M. Ives and others.

Tex., Run.—Detroit Plantation Co. incorporated with $20,000 capital stock by L. Conrad, R. C. Bean and A. W. Munsell.

Tex., Stamford.—Pastura Townsite Co. incorporated with $5800 capital stock by F. S. Hastings, W. T. Andrews, A. J. Swenson and T. J. Clark.

Va., Arlington.—Virginia Highlands Association (recently reported incorporated with capital stock of $100,000) purchased 100 acres of land for suburban development; will lay off building sites and consruct streets, sidewalks, sewers, water systems (supply piped from spring), etc., and make other improvements; plans erection of fireproof dwellings; one, four, five and six-room types, with flat roofs for gardens; brick and concrete construction; will use standard steel molds; architect in charge, Milton Dana Morrill, president of company, 405 Corcoran Bldg., Washington, D. C.

Va., Norfolk.—Chesapeake Seashore Corporation incorporated with $50,000 capital stock; H. L. Smith, president; D. R. Smith, vice-president; H. G. Smith, secretary-treasurer.

Va., Roanoke.—Raleigh Court Corporation, chartered with capital stock of $400,000, purchased 200 acres of land and will develop for residential section; J. Quitman Lovell, president, 14 Stock Exchange Bldg., Baltimore, Md.; James P. Woods, vice-president, Roanoke; Edw. D. Gregory, secretary-treasurer, Bedford City, Va.; plans by Meehan & Co., landscape engineers, Philadelphia, Pa., in association with Frank H. Smith, Dayton, O.; will construct roads, sidewalks and sewers and provide supply of water, light, etc.; company's offices with Beller & Wilson, Terry Bldg. (Mr. Lovell and assocites recently noted as to buy land for development.)

W. Va., Charleston.—St. Albans Land Co. incorporated with $25,000 capital stock by Ira G. Sayre, N. B. Ward, both of Charleston; J. H. Campbell, St. Albans, W. Va., and others.

LUMBER-MANUFACTURING PLANTS

Ala., Silas.—C. W. Stallworth, Cuba, Ala., will establish sawmill; cost $25,000.

Ga., Bainbridge.—Chas. C. Brown will erect mill to develop tract of timber recently purchased. (See "Machinery Wanted.")

La., Lake Charles.—Powell Lumber Co. purchased standing pine timber on 2280 acres of land on Beckworth Creek.

La., New Orleans.—Southern Crosstie Co. incorporated with $50,000 capital stock by Louis H. Hoover, Edwin H. Wharton Davies and Douglas and W. Wharton Davies.

La., New Orleans.—Bryan Black Lumber Co. incorporated with $50,000 capital stock by Bryan Black, Charles Hamlin Black and Graham Sinclair.

Miss., Georgetown.—Great Southern Lumber Co., Bogalusa, La., and Buffalo, N. Y., will, it is reported, duplicate in Pike county its Bogalusa plant; dispatches state expenditure of $3,000,000 is contemplated to construct and equip mills, electric plant, water-works, etc., for modern plant and town; location contemplated near Georgetown or Columbia. Referring to this report, A. C. Goodyear, second vice-president, Ellicott Square, Buffalo, N. Y., writes the Manufacturers' Record that "we have no information that we can give out, nor is there any immediate prospect of the erection of such a plant."

Miss., Grenada.—Postal Land Co. incorporated with $30,000 capital stock by C. W. Priestley, M. F. Swearingen and J. W. Burton, all of Sharon, Tenn.; purchased 720 acres of farm and timbered land in Quitman county.

S. C., Columbia.—Virginia-Carolina Lumber Co. incorporated with $75,000 capital stock by A. L. Howell and C. G. Watson.

N. C., Fayetteville.—Cooper Lumber Co. incorporated with $25,000 capital stock by W. J. Cooper, Fayetteville, and Daniel Johnson, Rowland, N. C.

N. C., Goldsboro.—Empire Manufacturing Co. incorporated with $20,000 capital stock; N. O'Berry, president; A. H. Edgerton, vice-president, general manager and treasurer; Thomas A. Dewey, secretary.

N. C., Lumberton.—Kingsdale Lumber Co. will, it is reported, rebuild plant recently reported burned.

N. C., Newbern.—H. S. Hancock has purchased sawmill and 2300 acres of timber land on Trent River.

N. C., Wilmington.—Carolina Naval Stores Co. incorporated with $100,000 capital stock by C. W. Bilfinger and J. M. Howard.

Okla., Oklahoma City.—M. E. McCloskey, 900 West Washington Ave., will erect planing mill; two stories; brick; cost $12,000.

Okla., Tahlequah.—Hardy Lumber Co. incorporated with $10,000 capital stock by Mark Whayne, C. L. Whayne and J. B. Horsley.

Tenn., Elizabethton.—Smith Lumber Co. incorporated with $10,000 capital stock by A. H. Smith, A. W. Smith, O. R. Morey and others.

Tenn., Spivey.—Spivey Manufacturing Co. incorporated with $10,000 capital stock by S. Carter, P. T. Biles, J. F. Griffith and others.

Tex., Fort Worth.—Kelsey Lumber Co. increased capital stock from $10,000 to $20,000.

Va., Bedford County. — Bedford County Lumber Co. of Manchester, Va., purchased 2000 acres of timber land in Bedford county estimated to contain from 12,000,000 to 15,000,000 feet of standing timber; will install sawmills and develop.

Va., Falls Church. — Gibson Corporation incorporated with $25,000 capital stock; J. N. Gibson, president; E. D. Johnson, secretary-treasurer.

Va., Honaker.—Lewis Creek Milling Co. incorporated with $10,000 capital stock; M. H. Settle, president; M. C. Clarke, vice-president; C. W. Fuller, secretary-treasurer; will establish planing mill.

Va., Suffolk. — Camp Manufacturing Co., Franklin, Va., purchased 44,000 acres of Dismal Swamp land.

METAL-WORKING PLANTS

Ala., Dolcido (not a postoffice).—Senn Manufacturing Co., main office Birmingham, Ala., will establish plant to manufacture pressed steel hoes and handles; daily capacity 5000; Edward Senn, president; A. C. Bruce, vice-president; Chas. Wegelen, secretary and treasurer; will open bids in about three months for erection of buildings; one 75x120 feet; one 32x70 feet; steel frame construction; corrugated galvanized roofing and siding; will install machinery, including shear, electric equipment, crude-oil furnace and electric welding machinery; opened machinery proposals January 1. (See "Machinery Wanted.")

Ky., Newport—Stovepipes.—Kentucky Stovepipe Co. incorporated by M. B. Kendrick, Sr., M. B. Kendrick, Jr., Henry Andrie and F. E. Myrick.

Texas.—F. M. and T. K. Glenn, Liberty, S. C., have purchased right to maufacture for Texas, on royalties, the products of John T. Burriss & Son, metal workers and makers of metal shingles, Anderson, S. C.; will install machinery. (See "Machinery Wanted.")

MINING

Mo., Joplin — Lead and Zinc. — Omaha-Petersburg Company will establish mill; is developing lead and zinc deposits at Quapaw.

Mo., Joplin—Lead and Zinc.—Clara Belle Mining Co. incorporated with $20,000 capital stock by J. S. Hout, Louis McKinley and William McKinley.

Mo., Joplin—Lead and Zinc.—Clara Bell Mining Co. incorporated with $20,000 capital stock by J. S. Hout, L. E. Hout, Louis Kinley and others.

Mo., Joplin — Lead and Zinc. — Maple Leaf Lead & Zinc Co. will erect concentrating plant; 250-ton mill design.

N. C., Franklin—Mica.—Sterling Mica Co. incorporated with $100,000 capital stock by Charles F. Dreihs, Cincinnati, Ohio; C. T. Holbrook, Franklin, and others.

N. C., High Point—Gold.—Dougan Davis purchased John Loflin gold mine for $5000 and will develop.

Okla., Clearview. — Clearview Mining & Manufacturing Co. incorporated with $10,000 capital stock by J. H. C. Lucas, N. H. Starks, J. E. Thompson and others.

Tex., Matagorda — Sulphur.—Gulf Sulphur Co. (lately reported incorporated with capital stock of $250,000) is drilling test wells preparatory to erection of plant costing probably $100,000; J. M. Allen, president, St. Louis, Mo.; Hugo Spitzer in charge at Matagorda.

MISCELLANEOUS CONSTRUCTION WORK

Ark., Little Rock—River Improvements.—C. H. Keats and T. C. Brown awarded contract to E. W. Strauss, Jackson, Miss., representative of River, Road & Harbor Construction Co., to curb Arkansas River and check erosion of banks; river frontage to be improved covers 7200 feet; Gabian system is to be used, which consists of sinking cement anchors in river bed at intervals and connecting these to shore by steel wire cables; screen mesh is hung from these cables, and these, catching sift as it is carried down river, form natural piers, upon and around which reclaimed land is gradually built; work in charge of Capt. Charles Kerr, company's engineer.

Tenn., Knoxville—Retaining Wall.—John W. Fenniken, chairman, will soon advertise for bids for construction of retaining wall at Louisville & Nashville freight railroad depot.

Tex., Dallas. — Dallas Golf and Country Club awarded contract for construction of dam and lake on its property north of Exall Lake; cost $5000 to $6000.

Va., Cape Charles — Wharf. — New York, Philadelphia & Norfolk Railroad, Elisha Lee, superintendent, Cape Charles, awarded contract to Armstrong & Latta, Philadelphia, Pa., to repair freight wharf; underpinning of freighthouse to be of concrete piles.

MISCELLANEOUS ENTERPRISES

Ala., Birmingham — Electrical Supplies. — Southern-Wesco Supply Co. incorporated with $30,000 capital stock; Oscar C. Turner, Birmingham, president; Rogers V. Scudder, St. Louis, Mo., vice-president; W. M. Bowles, Birmingham, secretary-treasurer.

D. C., Washington — Coal and Timber. — Sparks, Waggoner & Carrington organized with $150,000 capital stock by Rupert M. Sparks, Birmingham, Ala.; Horace L. Waggoner, Pittsburg, Pa., and Selwyn M. Carrington, Philadelphia, Pa.

Ga., Atlanta—Abattoir.—Atlanta Butchers' Abattoir & Stockyards Co., A. L. Suttles, president, is proceeding with erection of proposed abattoir and stockyards; 105x300 feet; basement floor fireproof, containing open-air series of pens for cattle in transit; capacity of plant, 150 cattle and 300 hogs daily; refrigerating plant with three times present killing capacity; cooling system; concrete floors with sanitary corners; reinforced-concrete retaining wall in front of building; incline for cattle from level of railroad switch; 14-foot drive 225 feet long; fireproof engine and boiler room, refrigerator and machine room, concreted all around; loading platform protected by fireproof awning; two offices.

Ga., Atlanta — Hand Laundry. — Georgia Hand Laundry Co. incorporated with $5000 capital stock by William Pharr, W. H. Copedge and J. M. Pharr.

Ga., Savannah—Printing.—Mutual Printing & Publishing Co. incorporated with $5000 capital stock by Jonathan Lucas, William E. Harper and others.

Ky., Livermore. — Atherton-Kidd Company incorporated with $15,000 capital stock by Otto Atherton, Allen E. Kidd and Elisha Atherton.

Ky., Louisville—Motor Cars.—American Car Co. incorporated with $9000 capital stock by Karl S. Daugherty, Daniel Robinson and Bessie G. Robinson.

La., New Orleans—Garage, etc.—Aschaffenburg Motor Car Co. incorporated with $100,000 capital stock by A. Aschaffenburg and Leo G. Aschaffenburg; will erect garage and apartment building.

La., New Orleans—Coal.—E. F. Ulmer Coal Co. incorporated with $5000 capital stock; E. F. Ulmer, president; P. H. Comfort, vice-president; E. F. Pilie, secretary-treasurer; will deal in coal, etc.

La., New Orleans—Freight Sheds and Terminals.—Mississippi Valley Transportation Co., New Bank of Commerce Bldg., St. Louis, Mo., will expend, it is reported, $250,000 for terminals and freight sheds at New Orleans, $50,000 at Baton Rouge, $100,000 at Vicksburg and Delta and about $700,000 at other Mississippi River cities between New Orleans and St. Louis. (Organization of company and general plans for operating freight steamers previously reported.)

Md., Baltimore—Taxicab Service.—Taxi-Service Co. of Baltimore incorporated with $500,000 capital stock; to take over Stewart's Central Stables at 211 Park Ave. and establish passenger and merchandise taxicab service.

Mo., Lexington—Publishing.—Lexitonian Publishing Co. incorporated with $3000 capital stock by Glover Branch, Estelle Branch and W. A. Porter.

Mo., Sedalia.—National Sanitary Co. incorporated with $10,000 capital stock by J. P. Donohue, C. C. Donohue, M. K. White and others.

Mo., St. Louis—Plumbing.—St. Louis Plumbing Co. incorporated with $5000 capital stock by Albert Rabenneck, John W. Calhoun and Carrie Rabenneck.

Mo., St. Joseph—Supplies.—Mannan-Smith Supply Co. incorporated with $10,000 capital stock by D. C. Mannan, H. M. Smith, C. F. Strop and others.

Mo., Kansas City—Plumbing.—Arthur McKinley Plumbing Co. incorporated with $10,000 capital stock by Sam S. McKinley, Maud E. McKinley and Arthur McKinley.

Mo., St. Louis—Plumbing.—Edward C. C. Reisel Plumbing Co. incorporated with $10,000 capital stock by Edward C. C. Reisel, Charlotte Reisel and William S. Goodrich.

Mo., St. Louis—Automobile Repair.—Automobile Repair Co. incorporated with $10,000 capital stock by L. E. Meidner, P. H. Allison and A. E. Gansman.

Mo., St. Louis—Motor Cars.—Pope-Hartford Motor Car Co. incorporated with $50,000 capital stock by Albert J. Davis, Noble H. Davis and Frank H. Braden.

N. C., Durham—Typewriter Exchange.—Durham Typewriter Exchange incorporated with $25,000 capital stock by F. M. Dillon, J. E. Johnson and others.

N. C., Fayetteville—Livery.—Cooper Livery Co. incorporated with $25,000 capital stock by W. J. Robertson, C. J. Cooper and others.

N. C., Vanceboro—Supplies.—Vanceboro Supply Co. incorporated with $25,000 capital stock by J. G. Forest, O. McLawhorn and others.

N. C., Wadesboro—Mercantile.—Morrow Bros. & Heath Company organized with $50,000 capital stock; will erect building.

N. C., Washington—Publishing.—Tidewater Printing Co. incorporated with $25,000 capital stock by James L. Mayo, George A. Phillips and E. R. Mixon.

Okla., Kansas—Publishing.—Delaware Tribune Co. incorporated by D. C. Jones, C. J. Carlton, H. R. Ellis and others.

S. C., Columbia—Laundry.—Capital City Laundry will erect addition to plant; brick; 100-foot frontage; will double capacity of present plant.

S. C., Cheraw—Printing and Publishing.—Cheraw Printing & Publishing Co. incorporated to conduct general newspaper and job printing business; J. S. Hartzell, secretary-treasurer.

Tenn., Concord—Contracting.—Doggett & Doughty Company incorporated with $25,000 capital stock to continue established business.

Tenn., Memphis—Construction.—Central Construction Co. incorporated with $25,000 capital stock by C. E. Terrell, H. P. Woods, C. B. Rutledge and others.

Tex., Austin—Slaughter-house.—T. B. Walker Manufacturing Co. will establish slaughter-house with initial capacity for killing 25 beeves daily. (See "Ice and Cold-storage Plants.")

Tex., Dallas—Motor Cars.—Childress Brush Motor Co. incorporated with $5000 capital stock by C. W. Childress, B. N. Childress, Ed R. Bumpass and R. M. Hardeman.

Tex., Port Arthur—Nursery.—C. D. Otis, Lake Charles, La., and John W. Gates, Port Arthur, Tex., organized Port Arthur Nursery and will expend $100,000 for establishment of nursery.

Tex., Lampasas—Hardware.—Fox & Mills Hardware Co. incorporated with $40,000 capital stock by W. J. Fox, R. S. Mills and W. A. Dumas.

Tex., Lampasas—Hardware.—Fox & Mills Hardware Co. incorporated with $40,000 capital stock by W. J. Fox, R. S. Mills and W. A. Dumas.

Tex., Brownsville—Mercantile.—Walker Brothers-Hancock Company incorporated with $20,000 capital stock by A. B. Walker, George F. Walker, J. W. Hancock and others.

Tex., Crockett—Mercantile.—Moore & Shivers incorporated with $10,000 capital stock by J. W. Shivers, C. W. Moore and F. F. Dhupak.

Tex., Houston—Paint.—Randolph Paint Co. incorporated with $30,000 capital stock by E. H. Nell, H. A. Randolph and William Kauffenberger; continue present establishment at 805-807 Prairie Ave.

Tex., Wolfe City—Mercantile.—Whitley-Gentry Company incorporated with $8000 capital stock by J. F. Whitley, J. W. Gentry and L. M. McWhirter.

Va., Richmond—Railway Supplies.—Midland Company incorporated with $10,000 capital stock; J. H. Sands, president, Roanoke, Va.; C. E. Worthan, Jr., vice-president, Richmond; L. B. Hatke, secretary-treasurer, Richmond.

W. Va., Charles Town—Orchard.—Kenmar Orchard Co. incorporated with $30,000 capital stock by Edward L. Worthington, Charles Town; E. R. Johnson, Pittsburg, Pa., and others.

W. Va., Charleston—Gas and Oil Lands.—Sergeant Oil & Gas Co. incorporated with $40,000 capital stock by C. W. Swisher, S. V. Mathews, M. B. Hawks and others.

W. Va., Wheeling—Garage.—Standard Auto Co. is having plans prepared by Geo. H. Dieringer, Wheeling, for two-story 75x95-foot garage; will be ready for bids January 15.

MISCELLANEOUS MANUFACTURING PLANTS

Ala., Dothan—Cigars.—Company is being organized with $25,000 capital stock to establish cigar factory; R. W. Lizenby, City Clerk, can give information.

Ala., Jacksonville—Silver and Tripoli.—Mr. Miller and associates contemplate addition to silver and tripoli works; will install grinding machine and establish pottery plant.

Ala., Montgomery—Butter, Ice Cream, etc. A. W. Kratzer, Lexington, Ky., will establish plant for manufacturing butter, cheese, ice cream, etc.; machinery purchased; leased building.

Ark., Blytheville.—M. P. Carpenter will establish plant to manufacture plows and harrows; will erect building 30x140 feet; concrete construction; cost $3000; construction my day labor. (See "Machinery Wanted.")

Ark., Jonesboro.—Eureka Manufacturing Co. incorporated with $6000 capital stock by A. V. Wolverton (president), W. E. Tally and W. Hedrington.

Ark., Little Rock—Candy.—Karcher Candy Co. increased capital stock from $50,000 to $100,000.

D. C., Washington—Train Control.—Buell Signal & Train Control Co. incorporated with $300,000 capital stock; R. W. Montague, president; H. M. Sterling, vice-president; J. W. Buell, secretary, all of McGill Building.

D. C., Washington.—Medicine Oxidase Laboratories incorporated with $50,000 capital stock; W. F. S. Thonssen, 315 C St. S. E., president; W. P. Ripley, 1406 10th St. N. W., vice-president; N. S. Moss, secretary-treasurer.

Fla., Jacksonville—Shoes.—Hutchinson Shoe Co. will erect factory building; four stories; reinforced concrete; brick veneer; concrete slab roof covered with felt, tar and gravel; cost $20,000.

Fla., Tampa—Cigars.—Samuel I. Davis & Co. awarded contract to John Drew, Tampa, for erection of cigar factory; brick and stone; three stories; 50x200 feet; cost $75,000. (Recently mentioned.)

Fla., Tampa—Cigars.—Samuel I. Davis awarded contract to John Drew, Tampa, for erection of cigar factory; 50x200 feet; brick and stone; plans by Fred. J. James, Tampa. (Recently mentioned.)

Ga., Atlanta—Bottling.—Ko-Kola Company incorporated with $100,000 capital stock by Carl N. Guess, M. L. Rockmore and L. P. Weathers.

Ga., Marietta—Marble.—Kenesaw Marble Co., A. V. Cortelyou, president, will probably rebuild plant reported burned; loss $150,000.

Ga., Rome—Safety Appliance.—J. T. Andrews, Montgomery, Ala., proposes establishment of plant to manufacture patented device to prevent derailment of trains.

Ga., Rome—Wagon Scales, etc.—Rome Scale & Manufacturing Co., A. Randle, president (recently noted to increase capital stock to $50,000), will build 50x50-foot foundry; manufactures wagon and platform scales, trucks, etc.

Ky., Louisville.—National Manufacturing Co. incorporated by Alfred Isenberg, James L. Isenberg and Harold Isenberg.

Ky., Louisville—Chemicals.—Superior Chemical Co. incorporated with $5000 capital stock by Percy N. Booth, Louisville; S. H. Robinson, Connersville, Ind., and M. J. Killits, Cleveland, Ohio.

Ky., Louisville—Bottling.—Falls City Bottling Works incorporated with $8000 capital stock by Julius Shapinsky, Harry Davis and Max Davis.

Ky., Williamstown—Tobacco.—Williamstown Tobacco Co. incorporated by R. T. Dickerson, E. D. Webster and J. W. Glover.

La., Lockport.—W. J. Brand, Detroit, Mich., and D. V. R. Manley, Toledo, O., will probably purchase 100,000 acres of land near Lockport and reclaim land, establish sugar plantations and erect sugar refineries.

La., New Orleans.—Cook Brewing Co., Evansville, Ind., will establish bottling plant; capacity 25,000 bottles; coolers capable of accommodating 300 barrels; will be distributing point for Alabama, Mississippi and Louisiana.

Md., Baltimore—Crackers.—Maryland Biscuit Co., 414-420 West German St., awarded contract to Morrow Bros., 218 West Saratoga St., Baltimore, for erection of plant to replace burned structure. (Previously mentioned.)

Miss., Gulfport—Paints, Oil, etc.—Mississippi Mercantile & Manufacturing Co. organized by F. Davenport to establish plant in Powers Bldg. to manufacture paints, floor oils, copper paint, etc.

Miss., Scranton—Ice Cream.—Pascagoula Street Railway & Power Co., R. A. Bowers, superintendent, will establish ice-cream factory at Scranton; not at Pascagoula as recently noted. (See "Machinery Wanted.")

Mo., Joplin—Concentrators.—Braecker Concentrator Co. incorporated with $5000 capital stock by M. J. Braecker, Peter Braecker, Minnie Braecker and others.

Mo., Kansas City—Storage Batteries.—Western Storage Battery Co. incorporated with $60,000 capital stock by John Sterlen, Ned Y. McCrae and Charles Andress.

Mo., Kansas City—Paint.—Iowa Paint Manufacturing Co., Fort Dodge, Iowa, purchased three and a half acres of land in Blue Banks (suburb) and will erect factory for dry yellow and red paints.

Mo., St. Louis—Pianos.—Stierlin Piano Co., F. C. Steirlin, president, 301 Dolph Bldg., 625 Locust St., awarded contract to R. C. Schisler for erection of building recently mentioned; six-story structure; 76x110x125 feet; mill construction; plans by Stephens & Pearson, St. Louis; cost of machinery (woodworking), $9000; machinery bids to be opened January 8; capacity of plant, four pianos daily.

Mo., St. Joseph—Rendering.—Union Rendering Co. incorporated with $30,000 capital stock by A. A. Keyes, Charles L. Walters, H. J. Bird and others.

Mo., St. Louis—Paper Boxes.—St. Louis Corrugated Paper Box Co. incorporated with $10,000 capital stock by W. V. Boyne, J. A. Clarke and C. M. Johnson.

N. C., Asheville—Talc Products.—Talcum Puff Co. will issue $25,000 of preferred stock for improvements to plant, including installation of machinery for manufacture of additional talc products.

Okla., Muskogee—Crushed Stone.—Muskogee Crushed Stone Co. will increase capacity of plant; expenditure, $15,000.

Okla., Oklahoma City—Beverages.—Western Mineral Water Co. will be incorporated with $30,000 capital stock; Clark C. Hudson, president; W. T. Hunt, secretary; will erect building and equip for manufacturing beverages.

Okla., Oklahoma City—Overalls.—Kerfoot, Miller & Co. increased capital stock from $200,000 to $300,000; will erect building and equip as overall factory; 25 machines.

S. C., Spartanburg—Brooms.—Muckenfuss Manufacturing Co. will rebuild plant previously reported burned; loss $20,000; brick; gravel roof; fireproof; will also erect brick warehouse.

Tenn., Morristown—Stock Medicine.—Brown Stock Medicine Co. incorporated with $10,000 capital stock by O. R. Moore, R. T. Moore, G. P. Moore and others.

Tenn., Pulaski—Pipe Tobacco.—Rural Tobacco Co. reorganized with $20,000 capital stock; Mark Arrowsmith, president; B. G. Mason, J. F. Neely, vice-presidents; J. M. Hardeman, purchasing agent; Floyd Hardeman, superintendent; J. H. Wells, general manager.

Tenn., Nashville—Paint.—Atlas Paint Co. will erect factory and office building; brick, steel and corrugated iron; cost $3000.

Tenn., St. Elmo—Medicine.—Chattanooga Medicine Co. awarded contract to Adams & Schneider, 1304½ East 8th St., Chattanooga, Tenn., for erection of $15,000 building previously mentioned. (See "Miscellaneous Structures.")

Tex., Arcola—Sugar, Syrup, etc.—McCullough Syrup & Refining Co. will install machinery and crushers and increase boiler capacity in mills on plantations; will double capacity of plants.

Tex., Brenham.—Creamery.—Brenham Creamery Co. purchased site and will erect creamery to replace present structure; will enlarge plant.

Tex., Dallas—Clothing.—Dallas Clothing Manufacturing Co. increased capital stock from $30,000 to $40,000.

Tex., Fort Worth—Overalls.—Fort Worth Overall Co. increased capital stock from $25,000 to $30,000.

Tex., Galveston—Headlights.—American Headlight Co. incorporated with $100,000 capital stock by Dave Weis, Houston, Tex.; will establish plant for manufacturing locomotive electric headlights; purchased property and patents of Anderson-Lacey Company.

Tex., Houston—Trunks.—Freyer Trunk Manufacturing Co. will double capacity of plant; will erect building 75x125 feet; three stories.

Tex., Houston—Bakery.—National Biscuit Co. will double capacity of plant; will erect building.

Tex., Houston—Household Goods.—Myers-Spalti Manufacturing Co. will erect annex to plant; four stories; 100x150 feet; 75,000 square feet floor space; cost $50,000.

Tex., San Benito—Gas.—Citizens of San Benito will install street-lighting system; 2000-candle-power incandescent gas lights; to be supplanted later by electric-light system operated by water-power. (C. W. Whittlesey recently noted interested.)

Va., Manchester—Distillery.—Southside Distilling Co. incorporated with $3000 capital stock; M. M. Burke, president; A. Vaughan, secretary-treasurer.

W. Va., Parkersburg—Shoes.—Graham-Bumgarner Shoe Co. will either erect addition to present plant or erect entire new factory, doubling present capacity.

W. Va., Ronceverte—Wrenches.—Brown Wrench Co. (recently reported incorporated with $50,000 capital stock) will establish plant to manufacture monkey wrenches; will occupy erected building; power supplied; will purchase machinery; F. B. Albert, president; J. F. Brown, secretary; C. P. Brown, manager. (See "Machinery Wanted.")

W. Va., Wheeling—Stogies.—Augustus Pollack Company awarded contract to J. Benton Neal & Co., Wheeling, for repairing boilers and installation of new machinery.

W. Va., Sistersville.—F. P. Iams, Pittsburg, Pa., and George Hartman, McKeesport, Pa., purchased Sistersville Brewery and will organize company to operate.

RAILWAY SHOPS, TERMINALS, ROUNDHOUSES, ETC.

Ala., Birmingham.—Louisville & Nashville Railroad Co. is reported as planning construction during 1910 of proposed car and locomotive shops at Birmingham or Boyles; W. H. Courtenay, company's chief engineer, Louisville, Ky., telegraphs Manufacturers' Record that construction has not been authorized and plans have not been made; T. E. Brooks is superintendent of Birmingham division.

Md., Brunswick.—Baltimore & Ohio Railroad Co., A. M. Kinsman, chief engineer, Baltimore, Md., will expend approximately $80,000 in improvements; contract recently noted awarded to Geo. B. Swift Company, Security Bldg., Chicago, Ill.; construction includes one standard 95-foot engine-house with 12 stalls; machine and blacksmith shops, smith, pipe and tin shop; carpenter shop and toolroom, 106x60 feet; steam-heating system; scrap bin, 20x40 feet; two locomotive-cleaning platforms, 76 feet long; 20x50-foot toilet and locker room for shopmen and enginemen; enginemen's work-report room and roundhouse; foreman's office, 20x35 feet; sewers; drains, water, steam, air and blow-off lines; larger buildings to be of brick and concrete construction.

Okla., Heavener.—Kansas City Southern Railway, A. F. Rust, resident engineer, Kansas City, Mo., will erect 10-stall roundhouse and machine shops; will construct 27 miles of switching and establish division point.

Okla., Shawnee.—Chicago, Rock Island & Pacific Railway, J. B. Berry, chief engineer, Chicago, Ill., will rebuild on enlarged scale machine shops damaged by explosion; expenditure, $18,000; A. T. Hawk, general architect of railroad.

Tex., Galveston.—Gulf, Colorado & Santa Fe Railway, C. F. W. Felt, chief engineer, Galveston, contemplates, it is reported, expending $250,000 in construction of roundhouse, machine shops and turntable.

ROAD AND STREET IMPROVEMENTS

Ala., Dothan.—City contemplates paving of various streets and about 50 miles of sidewalk; bids to be advertised; R. W. Lizenby, City Clerk.

Ala., Gordon.—Houston County Commissioners now inviting bids for construction of proposed 51 miles of road; will open proposals March 15; plans, etc., on file; W. J. Parish, County Commissioner. (See "Machinery Wanted.")

Ark., Little Rock.—City opened bids January 5 for street paving in improvement district No. 155; E. A. Kingsley, City Hall, is engineer in charge.

Ark., Pine Bluff.—Jefferson county will build 20 miles of rock and gravel macadam road this year by contract; James Gould, County Judge. (Previously noted.)

La., Homer.—City will open bids February 1 for four miles concrete paving; engineer not employed; G. G. Gill, Town Clerk. (See "Machinery Wanted.")

Md., Berlin.—City will not at present lay concrete sidewalks recently noted; Orlando Harrison, Mayor.

Miss., Gulfport.—M. P. Bouslog, chairman Street Committee, is preparing plans for construction of gravel road along East Beach St.

Miss., Mathiston.—City Council passed resolution authorizing issuance of $10,000 sidewalk bonds. Address The Mayor.

S. C., Sumter.—City awarded contract to J. D. McGee of Sumter to construct concrete sidewalks; W. Lovinglee, City Engineer. (Lately mentioned.)

Tenn., Winchester.—Franklin County Commissioners contemplate issuance of $100,000 of bonds to construct pikes.

Tex., Dallas.—Russell Realty Co. awarded contract to Stubbs Paving Co. of Dallas at about $12,000 to construct 47,670 square feet of four-foot sidewalks, with 11,917 linear feet curbs and gutters, in Winnetka Heights.

Tex., Dallas.—Municipal Commission has perfected plans for paving about one mile of Elm street with bitulithic; cost $100,000.

Va., Norfolk.—Board of Control will expend $1500 in curbing and guttering 19th St., contract recently noted awarded to C. B. Shaffer, Norfolk; City Engineer of Norfolk in charge of construction. (See "Machinery Wanted.")

Va., Portsmouth.—Local improvement boards of Sixth and Seventh wards contemplate macadamizing center of High St.; width 60 feet; E. B. Hawks of Street Committee submitted estimate of $47,000, including curbing and guttering.

Va., Richmond.—City awarded small contract for grading street; price of excavation, 18 cents per cubic yard; Chas. E. Bolling, City Engineer. (Previously noted.)

SEWER CONSTRUCTION

Ark., Little Rock.—City has not yet set date of opening bids on construction of sewer recently mentioned; to convey effluent from tanks in southwestern part of city to points beyond city limits; 8-inch and 12-inch pipe; cost about $4000; E. A. Kingsley, Superintendent of Public Works.

Fla., Kissimmee.—City proposes to vote on issuance of $50,000 of bonds for construction of sewer system and water-works; Xavier A. Kramer, Magnolia, Miss., engineer in charge. (Recently mentioned.)

Ga., Dublin.—City will extend sewer system to West Dublin. Address The Mayor.

Md., Berlin.—Company will probably be organized to construct sewer system. Address The Mayor.

Mo., Columbia.—City will construct sewer system, estimated to cost $50,000; bids will probably be opened about January 15; D. B. Duncan, City Engineer.

Mo., Joplin.—City awarded contract to Henry Kost of Joplin at $36,851.60 for construction of sanitary-sewer system in West Joplin. (Recently noted.)

Okla., Lawton.—Department of Interior, Washington, D. C., inviting proposals for construction of sanitary sewer system; will open bids February 16; plans, etc., on file with department, Mayor of Lawton and John D. Kennard, civil engineer, Lawton. (See "Machinery Wanted.")

Okla., Weatherford.—City will open bids January 28 for construction of concrete septic tank of 84,000 gallons capacity, two sand-filter beds, etc.; W. K. Cunningham, City Clerk; J. L. O'Hearn, Clinton, Okla., consulting civil engineer. (See "Machinery Wanted.")

Tex., Brownsville.—Brownsville Sewerage Co., William Kelly, president, will construct sanitary sewers; bids to be opened January 12. (See "Machinery Wanted.")

Va., Richmond.—City has awarded contracts for laying vitrified-pipe sewers, 12 to 20 inches in diameter, on certain streets; approximate length, 6130 feet; city furnishes pipe and cement, and lays pipe; contractors excavate, refill, etc., and furnish and lay bricks in stacks and steel inlets; contracts awarded on certain brick sewers, city furnishing cement, contractor excavating and refilling, and furnishing and laying brick; total amount for brick sewers, about $20,000; estimated length, 5120 feet; 24 to 57 inches diameter; Chas. E. Bolling, City Engineer. (Sewer construction previously mentioned.)

TELEPHONE SYSTEMS

Ark., Little Rock.—B. F. Kendrick, Pine Bluff, Ark., purchased Little Rock Telephone Co. and will expend $200,000 for improvements; will install central-energy system and connect by long distance with Pine Bluff; same management as Pine Bluff Telephone Co.

Ark., Oil Trough.—Oil Trough Telephone Co. incorporated with V. Y. Cook, president; Paul Butler, vice-president; May Morrow, secretary; Varina Cook, treasurer.

Ark., Van Buren.—Robert Alfred is manager of company organized to construct telephone line north from Van Buren.

Ky., McHenry.—Ohio County Farmers' Mutual Telephone Co. incorporated with $2400 capital stock by E. G. Austin, W. P. Huntley and J. C. Chinn.

N. C., Shopton.—Steel Creek Telephone Co. incorporated with $5000 capital stock.

Tex., Lanham.—Rock House-Lanham Telephone Co. incorporated by Wm. A. Agee, G. F. Kavanaugh and L. H. Craig.

S. C., Orangeburg.—Orangeburg & Bowman Telephone Co. organized by W. H. Dukes and J. L. Dukes; will establish telephone system between Orangeburg and Bowman and exchange at Bowman.

Tex., Granbury.—City granted franchise to Acton Telephone Co. to establish telephone system.

TEXTILE MILLS

Ga., Flowery Branch—Rope and Twine.—W. W. Cooper is interested in organization of company to manufacture rope and twine; has not purchased machinery. (See "Machinery Wanted.")

Ga., Macon—Silk.—Chamber of Commerce, Harry Burns, secretary, is negotiating with V. K. Osigian relative to establishing silk farm and mill.

N. C., Concord—Cotton Yarns.—Brander Cotton Mills Corporation (lately reported incorporated under Va., Richmond) takes over Magnolia Mills No. 1, recently mentioned purchased by lessees L. W. Brander and associates; contemplates adding 1000 spindles and 60 Jacquard looms; now has 2000 spindles, etc.; L. W. Brander is president.

N. C., Monroe—Sheetings.—Monroe Cotton Mills will install electrical drive, replacing present steam power; textile equipment includes 8736 ring spindles, 152 broad looms, etc.

N. C., Raleigh—Hosiery.—Martin Hosiery Mill will install 100 additional knitting machines; has awarded contract.

S. C., Columbia—Cotton Twine.—Glencoe Cotton Mills (reported incorporated last week with capital stock of $100,000) has organized with T. H. Wannamaker of Orangeburg, S. C., president; T. H. Wannamaker, Jr., also of Orangeburg, secretary, and G. M. Berry of Columbia, vice-president; will install over 5000 spindles for twine and warp production; electrical power, about 225 horse-power; Shand & Lafaye, Columbia, S. C., engineers in charge; will open building and machinery bids in about 30 days.

Va., Suffolk—Hosiery.—Maxwell Hosiery Mills incorporated with capital stock of $30,000; M. Maxwell, president; J. C. Holladay, vice-president; H. E. Maxwell, secretary-treasurer.

WATER-WORKS

Ala., Bessemer.—City Council authorized purchase of water-works for $500,000. Address The Mayor.

Ala., Montgomery.—City contemplates construction of one and possibly two reservoirs with capacity of about 2,000,000 gallons each to increase water supply in addition to installation of pumps recently mentioned; Gaston Gunter, Mayor.

Ala., Pratt City.—Birmingham Waterworks Co., Birmingham, Ala., purchased municipal water-works at Pratt City for $25,000 and will operate; will construct pipe line from Ensley to Pratt City, upon completion of which water will be furnished direct from Birmingham system; Pratt City plant will then be discontinued.

Ark., Fayetteville.—Board of Control awarded contract to C. D. McIlroy of Fayetteville, at $26,445, to construct auxiliary supply pipe line; water is to be piped from Clear Creek, which has flow of about 1,000,000 gallons daily.

Fla., Kissimmee.—City proposes to vote on issuance of $50,000 for construction of water-works and sewer system; Xavier A. Kramer, Magnolia, Miss., engineer in charge. (Recently mentioned.)

Ky., Louisville.—Board of Water-works has been authorized to lay 24-inch distributing main from Crescent Hill to Baxter and Finzer Aves.; Theodore A. Leisen is chief engineer and superintendent.

Md., Elkton.—City Council will probably issue bonds for construction of water-works. Address The Mayor.

Miss., Mathiston.—City Council passed resolution authorizing issuance of $20,000 water-works bonds. Address The Mayor.

Okla., Ardmore.—City Commissioners awarded contract to Healey Construction Co. of Ardmore at $7300 to raise dam at city lake sufficiently to double water supply.

Okla., Tishomingo.—City contemplates installation of filter plant. (See "Machinery Wanted.")

Okla., Weatherford.—City will open bids January 28 for construction of standpipe and for furnishing boiler, air-lift pumping system for five wells, pump, etc., in connection with extension of water-works; W. K. Cunningham, City Clerk; J. L. O'Hearn, Clinton, Okla., consulting civil engineer. (See "Machinery Wanted.")

Tex., Dallas.—City will open bids February 2 for construction of dam, spillway and pumping station at White Rock water-works reservoir; certified check for $5000 to accompany each bid; J. M. Bassett, City Engineer. (Recently mentioned.)

Tex., Graham.—City will install filtering plant for city water; cost, $5000. Address The Mayor.

W. Va., Wheeling.—City Council rejected award of contract to J. A. Swingle & Co., Zanesville, O., at $89,316 for erection of pumphouse and drilling of well, and instructed Board of Control to invite new bids on well and pumphouse separately and as a whole.

WOODWORKING PLANTS

Ala., Dolcido (not a postoffice)—Handles.—Senn Manufacturing Co., Edward Senn, president, main office, Birmingham, Ala., will establish plant to manufacture pressed-steel hoes and handles; daily capacity, 5000. (See "Metal-working Plants.")

Ark., Argenta—Paving Blocks.—Ayer & Lord Tie Co. contemplates erection of addition to plant for manufacturing creosoted wooden paving blocks.

Fla., Crystal River.—Cedar Pencils.—Joseph Dixon Crucible Co. will not consider at present rebuilding $500,000 plant lately reported burned; main office, Jersey City, N. J.

Ga., Rome—Vehicles.—Etowah Vehicle Manufacturing Co. incorporated with $30,000 capital stock by J. H. Rhodes and Lewis R. Smith; will manufacture buggies, wagons and fire apparatus. (Recently mentioned.)

Ga., Rome—Barrel Heads.—Rome Cooperage Co. (recently noted to establish barrel-head plant) awarded contract for erection of first buildings; W. M. Towers will be general manager; contemplates operation by February 15; capital stock $10,000.

La., Delhi—Heading.—W. E. Leeds, Camden, Ark., contemplates establishment of heading mill.

Miss., Hattiesburg—Staves, Headings, etc. Chess & Wymand Company of Louisville, Ky., purchased 25-acre site and will establish cooperage.

Okla., Muskogee—Furniture.—J. A. Wilson and associates will erect furniture factory; will buy furniture in rough and finish.

Tenn., Chattanooga—Chairs.—Chattanooga Chair Manufacturing Co. organized with J. H. Parham, president; Claude Smith, secretary-treasurer; to take over Parham Chair Warehouse and manufacture chairs; office, 125 Main St.

Tenn., Nashville—Carriages.—Bearden-Chenoweth Carriage Co. increased capital stock from $10,000 to $20,000 and changed name to Bearden Carriage Co.

Tex., Austin—Woodenware.—Ellsworth Dewey, Houston, Tex., contemplates, it is reported, establishment of plant for manufacturing woodenware.

Tex., Bay City—Furniture.—B. E. Norvell, J. W. Magill and A. D. Hensley are interested in establishment of furniture factory to cost $25,000.

Tex., Galveston—Cabinet Work.—Adolph Stein, 2212 Mechanic St., will erect building and equip for cabinet, office furniture and fixture plant; cost of building, $4000.

Va., Portsmouth—Furniture.—Silver Dollar Furniture Co. incorporated with $10,000 capital stock; W. D. Joyner, president; S. H. Whitley, vice-president.

BURNED

Ala., Birmingham.—Buckeye Cotton Co.'s hullhouse and warehouse; loss, $10,000.

Ala., Huntsville.—Henry McDonell's cannery; loss $12,000.

Ala., Huntsville.—Huntsville Canning Co.'s plant; loss $12,000.

Ala., Thorsby.—American Box & Veneer Co.'s plant.

Fla., Pensacola.—W. K. Hyer's residence.

Ga., Cecil.—J. N. Bragg & Co.'s sawmill; loss $15,000.

Ga., Marietta.—Kensaw Marble Co.'s plant; loss $150,000.

Ga., Sylvania.—Citizens' Trading Co.'s store, loss $10,000; Powell Pharmacy, loss $6000; P. A. Mock's store building, loss $25,000; J. J. B. Morel's building, loss $10,000.

Ga., Sylvania.—Citizens' Trading Co.'s building; T. A. Mock's building; Powell Pharmacy; I. Silver's building; loss $75,000.

Ky., Greendale.—Dormitory at Kentucky School of Reform of Juvenile Criminals; loss $5000.

Ky., Paris.—Paris Methodist Church; loss $20,000; Rev. M. J. Chandler, pastor.

La., Estherwood.—Dan Stille's residence; loss $10,000.

La., Crowley.—Charles E. Kimmerly's residence.

La., Kenner.—Jos. Natal's residence.

La., Midland.—A. Stelly's residence; loss $4000.

La., Shreveport.—Robinson Bros.' warehouse, loss $2000; A. J. Roquemore's store building, loss $4400; Robson, Stewart & Jenkins' marble works, loss $3000.

Md., Shippensburg.—William E. Reddig's store; loss $30,000.

Miss., Indianola.—Mrs. R. W. Rowe's residence; loss $10,000.

Miss., Water Valley.—Water Valley Furniture Co.'s building, loss $10,000; J. W. Walker's building, loss $3000; J. R. Cahill's building, loss $3000; Water Valley Bottling Works, loss $3000; W. J. Bowles' building, loss $3000.

Mo., Excelsior.—J. W. Hyder's building; E. L. Riley's building; total loss, $10,000.

Mo., Gallatin.—Woodruff Hotel; loss $12,000 to $15,000; Frank A. Wood, proprietor.

Mo., St. Louis.—M. Kahn Plate Glass Co.'s warehouse; loss $100,000.

N. C., Concord.—J. A. Kimmons' storehouse; loss $4000.

N. C., Rose Hill.—J. H. Fussell & Son's store, loss on building, owned by J. C. Williams, $3500; Bank of Rose Hill, loss $6000.

N. C., Stantonsburg.—Frank Coley's sawmill; loss $2000.

N. C., Thomasville.—J. F. Stokes' residence.

N. C., Wilmington.—Cape Fear Fisheries Co.'s wharf and building; loss about $3000.

Okla., Mounds.—Buildings occupied by Johnson & Co., Reynolds & Casteen, Mounds Grocery Co., Campbell Meat Market and Walker Drug Co.; total loss $50,000.

Okla., Muskogee.—Parker Washington Co.'s paving plant; loss $10,000.

S. C., Lamar.—McSween Mercantile Co.'s store; loss $40,000.

S. C., North.—O. K. Livingston's store, loss

$2800; J. R. Leysath Company's store, loss $3000.

S. C., Camden.—E. C. von Tresckow's residence.

S. C., Sumter.—Marion Moise's residence; loss $19,000.

S. C., Swansea.—Peeder & Lybrand's ginhouse.

Tenn., Chattanooga.—Zack Taylor Lumber Co.'s boiler and dry rooms; loss $10,000.

Tenn., Chattanooga.—Talley Produce Co.'s store; loss on building, owned by T. L. Montague, $15,000.

Tenn., Johnson City.—Building owned by L. Ambrust and Guy L. Smith; loss on building, $7500.

Tenn., Johnson City.—Ambrust-Smith Bldg., containing Elks' Home and offices; estimated loss, $50,000.

Tex., Advance, R. F. D. from Garner.—Cotton gin owned by John Mates and L. A. Stratten; loss $4000.

Tex., Caddo Mills.—Cox & Wheat's building; loss $18,000.

Tex., Dallas.—J. W. Pierson's residence, loss $3500; E. T. Moore's residence, loss $3500.

Tex., Decatur.—Lillard & Malone's cotton gin; loss $8000.

Tex., Dixon.—Will Stevens' cotton gin; loss $4000.

Tex., Ennis.—A. H. Oliver's residence; loss $6000.

Tex., Galveston.—Galveston Wharf Co.'s cotton warehouse on Pier 13 damaged; loss $10,000.

Tex., Prattville, R. F. D. from Cooper.—I. J. Shumate's cotton gin; loss $5000.

Tex., Taylor.—Houston Brewing Co.'s cold-storage plant and ice vault; building owned by Big Four Ice Co., Waco, Tex.

Va., Bolar.—F. C. Smith's hotel at Bolar Springs; loss $10,000.

Va., Bristol.—Bristol Chautauqua building; loss $2500.

Va., Fredericksburg. — Wharton Fisheries Co.'s fish guano factory at Dymer's Creek; loss $22,000.

Va., Holland.—Majestic Theater; Wilson J. Holland's building, loss $30,000; I. A. Luke's building, loss $15,000; buildings owned by S. W. Holland, J. T. Rawls & Co., J. T. Cutchins, S. W. Holland, Franklin Pierce, J. G. Holland, J. Edward Holland, B. W. Council, J. Richard Holland, William T. Howell, E. G. Howell, J. H. Britt, B. G. Porter, H. H. Holland, Lucille Holland, Mrs. Sallie Joyner, P. O. Johnson, J. R. Davidson, B. R. Daughtie and Mrs. Lizzie A. Holland; total loss, $120,000.

Va., Lynchburg.—McWane Pipe Works' office and storage depot; loss $35,000.

Va., Norfolk.—C. R. Major's candy kitchen.

Va., Norfolk.—H. G. Williams & Co.'s whiskey-house; loss $45,000.

Va., Portsmouth.—O. L. Williams' livery stables; loss $125,000.

Va., Pulaski.—Virginia Iron, Coal & Coke Co.'s stockhouse at its Dora furnace; company's main offices, Bristol, Va.-Tenn.

Va., Reid's Ferry.—George Robert Bunting's residence, storehouse and smokehouse, loss $4000.

W. Va., Huntington.—Boggess Stove Works; loss $8000.

BUILDING NOTES

APARTMENT-HOUSES

Mo., St. Louis. — La Blanche Realty & Building Co. secured permit for erection of proposed three-story apartment-house to cost $30,000.

N. C., Charlotte.—S. R. Collins, Philadelphia, Pa., will have plans prepared by Hunter & Gordon of Charlotte for apartment-house; brick veneer with stone or marble trimmings; four apartments; cost $10,000.

Tenn., Chattanooga.—J. P. McMillan, care of Huntington & Sears, James Bldg., is having plans prepared by Huntington & Sears for two-story-and-basement flats on Poplar St.; eight flats; brick; composition roof; stained pine interior finish; concrete basement floor; tile porch floors; cabinet mantels; electric and gas lighting; cost $13,000; architects to award contracts; plans ready about January 10.

Tex., Houston.—George Docker has plans by Henry T. Phelps, San Antonio, Tex., for apartment-house; two stories; brick and steel; contain six flats, with bath and other facilities; cost about $10,000.

Tex., Houston.—J. O. Ross awarded contract to Fred A. Jones Building Co. of Houston to erect apartment-house; seven stories and basement; 139x100 feet; fireproof; reinforced concrete construction, faced with pressed brick, cut stone and terra-cotta; 67 apartments, ranging from two to seven rooms each; about one-half of roof space will be furnished as roof garden, with promenade tile floor and four pergolas; each apartment will be equipped with dumbwaiter and refrigerator supplied from central refrigerating plant in basement; steam or vapor system of heating, controlled by automatic regulators; passenger and freight elevators; electric-light and gas fixtures; two main entrances, each having marquise of iron and steel, with glass roof; all corridors will have terrazzo floors, with tile borders and marble wainscoting; main lobby and stairway finished in marble; cafe will have tile floors, marble base, paneled oak waiscoting and grained plastered ceilings; building will be arranged to have private power plant; engine and boiler rooms will be in separate building; estimated cost $350,000; plans by Sanguinet & Staats of Houston and other cities. Alfred E. Barnes, manager of architectural firm, will supervise construction. (Recently mentioned.)

Va., Norfolk.—A. C. Omohundro, 410 Granby St., secured permit for erection of proposed apartment-houses; four buildings; 51x78 feet; sharp roof; slate; grates and gas heating; gas and electric lighting; cost $30,000; plans by Neff & Thompson, Atlantic Trust Bldg., Main St., Norfolk; contractors, Sawyer Bros., Granby and 27th St., Norfolk.

BANK AND OFFICE BUILDINGS

Ala., Bessemer.—James Hillhouse and Jas. Strong, Birmingham, Ala., will erect office building; seven stories; steel; elevators.

Ark., Dardanelle. — People's Bank, J. B. Crownover, president (recently noted to rebuild burned structure), has not yet selected architect to prepare plans for building; 36x110 feet; to contain postoffice, storerooms and offices; semi-fireproof construction; steam heat; electric lighting; cost $20,000.

Ala., Montgomery.—Louisville & Nashville Railroad, W. H. Courtenay, chief engineer, Louisville, Ky., has completed plans, it is reported, for proposed yard office building; two stories; frame; six rooms; granitoid platform; cost $6000.

Ga., Macon.—Georgia Life Insurance Co. contemplates erection of office building; 10 stories; concrete and steel; cost $200,000; has plans in view.

Ky., Beattyville.—O. S. Strother, Winchester, Ky., has contract to erect bank building.

Ky., Louisville.—Board of Water-Works awarded contract at $53,306 to Bailey & Koerner of Louisville to erect office building; brick; fireproof; two stories; 57x99 feet; plans by Theodore A. Leisen, chief engineer and superintendent. (Lately mentioned.)

La., New Orleans.—City Bank & Trust Co., 122 Carondelet St., awarded contract to Jos. W. Lennox, 301 Elmira Ave., New Orleans, for erection of bank and office building; 32x140 feet; mill construction; steam heat; electric lighting; cost $25,000; plans by DeBuys, Churchill & Labouisse, 817 Hibernia Bldg., New Orleans. (Mentioned in October.)

Md., Baltimore.—Maryland National Bank, Baltimore and Calvert Sts., awarded contract to Morrow Bros., 218 West Saratoga St., Baltimore, for erection of office building at Sharp and Lombard Sts. to replace burned structure; cost $20,000. (Recently mentioned.)

Miss., Indianola.—C. C. Moody will rebuild block recently reported burned; will erect two-story 40x40-foot structure with four rooms; also five-room one-story 20x40-foot building; for cotton offices and law offices; will open bids about January 15.

Md., Clear Spring.—Clear Spring National Bank (Elwood McLaughlin and others) contemplates erecting bank building.

Mo., Joplin. — S. A. Underwood, Kansas City, Mo., has plans for store and office building; three stories; cost $20,000 to $25,000.

N. C., Rose Hill.—Bank of Rose Hill will rebuild bank building reported burned at loss of $6000.

Okla., Muskogee. — Walter Howard will erect three-story office building.

Okla., Pittsburg (not a postoffice). — C. Bond, Lawrenceburg, Ky., awarded contract to W. E. Vorhees, McAlester, Okla., to erect brick bank building.

S. C., Greenwood.—Cothran & Cothran, Greenwood, are preparing plans for Grier & Park three-story office building of fireproof construction; five stores, first story; 37 offices on each floor above; tile and maple floors; steam heat; lot 110x120 feet; plans to be ready in about six weeks; all correspondence to be addressed to architects.

Tex., Dallas. — Commonwealth National Bank, Ragan Wofford, vice-president, purchased site, 25x100 feet, for $51,000, on which to erect office building; 16 stories; steel frame; fireproof; cost about $800,000.

Tex., Dallas.—Dallas City Land Co., Royal A. Farris, president, is having plans prepared by C. D. Hill & Co., Dallas, for remodeling purchased building recently noted; 100x100 feet; six stories and basement; marble tiling, fixtures, etc.; will install power plant complete; also elevator; cost $60,000; will open bids about February 1.

Tex., Shiro.—First State Bank awarded contract to C. W. Fugua, Shiro, for erection of brick bank building recently mentioned; size 25x44 feet; cost $3000; plans by Green & Briscoe, Houston, Tex.

Tex., Thorndale.—C. D. Hill & Co., architects, Wilson Bldg., Dallas, Tex., will receive bids until January 10 for erection of two-story bank building at Thorndale; certified check for $500; plans on file at office of architects as above, at First National Bank, Thorndale, and at office of Austin National Bank, Austin, Tex.

Va., Danville.—Deitrick & Pearson of Danville were awarded contract for erection of First National Bank Building recently noted; 30x100-foot structure; partly fireproof; cost $60,000; plans by Frye & Chesterman, Lynchburg, Va.

Va., Hamilton.—Farmers and Merchants' National Bank will have plans prepared by Marsh & Peter, 520 13th St. N. W., Washington, D. C., for bank building.

Va., Lynchburg.—Lynchburg Foundry Co., H. E. McWane, president, will rebuild office and storage depot reported burned at loss of $35,000.

Va., Portsmouth.—Bank of Portsmouth has not yet definitely prepared plans for bank building recently noted.

Va., Richmond.—Broad Street Bank purchased and will remodel bank building.

CHURCHES

Ala., Birmingham. — Twenty-first Avenue Methodist Church will rebuild burned edifice. Address The Pastor, Twenty-first Avenue Methodist Congregation.

Ala., Eufaula.—St. James Episcopal Church is arranging for completion of church; A. H. Merrill and others, committee.

D. C., Washington.—Board of Church Extension, M. E. Church South, W. F. McMurry, corresponding secretary, 707 West Chestnut St., Louisville, Ky., writes that proposed monumental church building is to cost about $250,000; has not engaged architect. (Lately noted.)

Ga., Atlanta. — Western Heights Baptist Church, Rev. Dr. Shuler, pastor, will erect edifice.

La., Arcadia.—Methodist Church will rebuild burned edifice; D. M. Atkins, chairman building committee.

La., Bogalusa.—Ladies' Aid Society, Mrs. A. D. Spooner, president, awarded contract to A. J. Denham, Bogalusa, for erection of small chapel recently noted; mill construction; electric lighting.

Mo., Joplin.—Evangelical Lutheran Immanuel Church, Rev. Louis Seidel, pastor, contemplates erection of church and parochial school building to cost $25,000.

N. C., Winston-Salem.—West End Methodist Church purchased site on which to erect edifice. Address The Pastor West End Methodist Congregation.

Tex., Fort Worth.—Broadway Presbyterian Congregation will soon invite bids for erection of edifice to cost $60,000. Address The Pastor, Broadway Presbyterian Congregation. (Previously mentioned.)

Tex., Quanah.—M. E. Church South, J. R. Henson, pastor, will open bids within next few months for erection of edifice recently mentioned (McDonald Street Methodist Church); steam or hot-air heat; cost $45,000; plans not prepared; pastor desires correspondence with architects. (See "Machinery Wanted.")

Tex., San Antonio.—Prospect M. E. Church South will open bids about February 1 for erection of $25,000 edifice recently noted; 60x90 feet; dome; heating and lighting; architect, W. N. Hagy, Frost Bldg., San Antonio.

W. Va., Bethany.—Christian Church will erect edifice to be known as Westminster Building; stone and brick; cost $50,000. Address The Pastor, Christian Congregation.

COURTHOUSES

Ala., Birmingham.—Jefferson County Board of Revenue, Job Going, president, will open bids about January 15 for erection of recently mentioned addition to courthouse; three stories; fireproof; 50x42 feet; cost $35,000 to $40,000; electric elevator; plans for structure not yet accepted.

Md., Towson.—Baltimore County Commissioners will petition Legislature for additional appropriation for courthouse; $60,000 has been appropriated for erection of two wings. (Previously mentioned.)

DWELLINGS

D. C., Washington.—Mrs. Mary L. King, 3023 Cambridge Pl. N. W., will erect residence on 14th St. Ter.; detached; 10 rooms and two baths; cost $8000.

D. C., Washington.—M. H. Herriman, 51 Bryant St. N. W., has plans by A. H. Beers, 1333 G St. N. W., Washington, for two residences in Saul's Addition; detached; nine rooms and two baths.

Fla., Palatka.—Leo Jacobson awarded contract to George Tilliman, Palatka, for erection of residence; cost $4000.

Fla., Pensacola.—J. D. Waters will erect three dwellings; wood; 31x31 feet; cost $4500.

Fla., Pensacola. — Jesse R. McLane will erect residence; wood; brick foundation, 67x67x75 feet; two stories; cost $10,000; A. R. Warner will superintend construction.

La., New Orleans.—F. K. Zachringer will erect dwelling.

Md., Baltimore.—Builders' Mortgage Security Association, through Herman Scherr, 130 Jackson Pl., purchased sites on 10th, Brighton and Presstman Sts. and will erect 150 semi-detached cottages; cost $350,000.

Md., Baltimore.—Thomas Biddison, 1832 West Baltimore St., is having plans prepared by Clyde N. Friz, 11 East Pleasant St., Baltimore, for two cottages on Elgin Ave., Walbrook; porch fronts; slate roofs; cost $6000 each.

Md., Baltimore.—Sterling Realty Co., 13 East Fayette St., had plans prepared by Jacob F. Gerwig, 210 East Lexington St., Baltimore, for seven 14x44-foot dwellings costing $1000 each; hot-air heat; gas and electric lighting; construction by owner.

Md., Baltimore.—Highland Land Co., John J. Watson, president, contemplates erection of 20 cottages; contract for four awarded to Boyd & Huff, 941 North Bond St.; to Edward G. Turner, 2010 Harlem Ave., for one; 28x39 feet; frame; steam heat; hardwood floor and finish; tile floors, wainscoting and shower in bathrooms; plans by Herbert C. Aiken, 223 St. Paul St., Baltimore.

Md., Baltimore.—Chas. W. Spangler, 1539 Harlem Ave., will probably open bids January 15 for erection of dwelling recently noted; 28x32 feet; frame; steam heat; electric and gas lighting; cost $3900; plans by Herbert C. Aiken, 223 St. Paul St., Baltimore.

Md., Baltimore. — Edward J. Gallagher Realty Co., Lakewood and Eastern Aves., will erect 30 dwellings on Chesapeake St., 14x70 feet; 10 on Milton Ave., 13x44 feet, and two on Milton Ave., 14x65 feet; two stories; brick; tin roofs; furnace heat; cost $38,000.

Md., Baltimore.—M. Oldham Lewis, 1504 West Lexington St., had plans by Henry J. Tinley, 314 North Charles St., Baltimore, for dwelling on Rosly Ave.; two and a half stories; frame; slate roof; hot-water heat; site 26x34 feet; cost $4500.

Md., Chevy Chase.—Edward Henkel, 1647 Lamont St. N. W., Washington, D. C., will open bids February 1 for erection of dwelling after plans by E. D. Ryerson, Chevy Chase, Md.; two-story structure, with attic and cellar; hot-water heat; electric lighting; cost $5500. (Recently noted under Washington, D. C.)

Md., Eccleston.—John K. Shaw, Jr., 40-41 Maryland Life Bldg., Baltimore, Md., awarded contract to George A. Blake, Law Bldg., Baltimore, for erection of residence; Georgia colonial style; two and a half stories; brick; marble trimmings; slate roof; center building and two wings; 25 or 30 rooms; estimated cost $100,000; plans by Wilson Levering Smith, Law Bldg., Baltimore, Md. (Recently mentioned.)

Md., Ellicott City.—Dorsey M. Williams purchased site near Ellicott City, and will erect number of suburban dwellings.

Md., Mt. Washington.—Thomas Strouse's dwelling (plans recently noted prepared by Herbert C. Aiken, 223 St. Paul St., Baltimore) will be 39 feet 8 inches by 34 feet 4 inches; reinforced concrete construction; front and side porches; hardwood finish; hot-water heat; construction by owner.

Miss., Brookhaven.—C. S. Butterfield, Norfield, Miss., awarded contract to Drury & Feldt, Brookhaven, for erection of dwelling; 87x96 feet; hot-air heat; electric lighting; cost $35,000; plans by Toledano & Wogan, 701 Macheca Bldg., New Orleans, La.

Md., Sparks Station (not a postoffice).—Joseph S. Willoughby has plans by Coalridge & Carlson, Boston, Mass., for residence; two

stories and attic; frame; 52x30.4 feet; hardwood interior finish; cost $10,000.

Miss., Columbia.—W. K. M. Dukate, Biloxi, Miss., is having plans prepared by J. E. Greene, Columbia, for eight dwellings; cost $13,000.

Mo., Kansas City.—P. H. Hovey, 220 Dwight Bldg., awarded contract to A. E. Hofer, 4005 Genesee St., Kansas City, for erection of residence recently mentioned; 42x44 feet; Portland cement plaster on iron lath; hot-water heat; electric lighting; plans by John W. McKecknie, Kansas City. (See "Machinery Wanted.")

N. C., Gastonia.—Mrs. E. C. Wilson will open bids about January 25 for erection of dwelling recently mentioned; colonial style; frame construction; hot-water heat; electric lighting; cost $10,000; plans by Sayre & Baldwin, Anderson, S. C.

S. C., Columbia.—George R. Rembert has plans for erection of dwelling.

Tenn., Hill City.—Chas. Cate, Terace St., East Lake, Tenn., contemplates erection of brick residence on Mississippi Ave., near Normal Park, Hill City.

Tenn., Memphis.—K. M. Rootes awarded contract to W. S. La Grill, Memphis, for erection of dwelling; two stories; brick veneer; slate roof; cost $10,000.

Tex., Bay City.—Fred. S. Robbins will erect residence; two stories; cost $8000.

Tex., El Paso.—N. Abraham will erect tenement-house; 27x118 feet; cost $4500.

Tex., San Antonio.—T. T. Campbell will erect residence; colonial style; frame; cost $6000.

Va., Richmond.—Mollie E. Lacy will erect two-story brick dwelling; cost $4000.

GOVERNMENT AND STATE BUILDINGS

Ark., Hot Springs—Postoffice.—Treasury Department, office of Supervising Architect, James Knox Taylor, Washington, D. C. Proposals will be received until March 1 for construction (including plumbing, gaspiping, heating apparatus, electric conduits and wiring) of extension to United States postoffice at Hot Springs, in accordance with drawings and specification, copies of which may be obtained from custodian at Hot Springs or at above office, at discretion of architect.

Fla., Fort Barrancas—Army Buildings.—Sealed proposals in triplicate will be received until January 28 for constructing, plumbing, heating and electric lighting, one double set N. C. S. quarters and one band kitchen at Fort Barrancas, and one double set C. E. quarters at Fort Pickens, Fla. Plans and specifications furnished upon deposit of $10 to insure return. Full information and blanks furnished upon application to constructing quartermaster.

Ky., Paducah—Postoffice.—B. T. Davis of Paducah may be awarded contract at about $9000 for remodeling interior of U. S. postoffice and courthouse; Moore & Sons, Nashville, Tenn., have contract for exterior stone work; James Knox Taylor, Treasury Department, Washington, D. C., is supervising architect. (Noted in September.)

La., Fort St. Philip—Oilhouse.—Office of Quartermaster, New Orleans, La. Proposals for construction of oilhouse will be received until February 1; information, plans and specifications furnished on application. Address Capt. C. D. V. Hunt, Q. M., U. S. Army.

Miss., Meridian—Postoffice and Courthouse. Treasury Department, office of Supervising Architect, James Knox Taylor, Washington, D. C. Proposals will be received until February 8 for extension, remodeling, etc. (including plumbing, gaspiping, heating apparatus, electric conduits and wiring and standard clock system), of United States postoffice and courthouse at Meridian, in accordance with drawings and specification, copies of which may be had from custodian at Meridian or at above office, at discretion of architect.

Okla., Oklahoma City—Postoffice.—M. J. Gill & Co., Ardmore, Okla., have contract at $209,196 to erect United States postoffice. (Recently mentioned.)

Okla., Vinita — Asylum. — State Board of Affairs received plans for first two buildings for Eastern Insane Asylum, as prepared by Charles W. Dawson, Muskogee, Okla.; structures are to be two stories and basement, 182x77 feet; brick and reinforced concrete; cost $150,000.

W. Va., Huntington—Asylum.—West Virginia Architects & Builders' Co. of Huntington is lowest bidder at $48,749 for erection of building for male patients at West Virginia Asylum; plans by H. Rus Warne, Charleston, W. Va. (Recently mentioned.)

HOTELS

Ala., Montgomery.—Exchange Hotel Co. contemplates erecting addition.

Ala., Opelika.—C. C. Torbert's building (contract recently noted awarded to B. E. Hudson, Opelika, and 418 Peters Bldg., Atlanta, Ga.) will be three stories; 100x160 feet; ordinary construction; steam heat; tile floors, cement columns, stone trimmings, etc.; cost $50,000; architect, B. E. Hudson.

Ga., Macon.—E. P. Frazer is considering erection of 100-room tourist hotel.

Ga., Savannah.—Savannah Hotel Co. incorporated with $209,000 capital stock by J. J. Rauers, D. R. Thomas, John Flannery, Edward F. Lovell and others.

Mo., Kansas City.—Samuel J. Whitmore of Hotel Alexandra, Los Angeles, Cal., states that he and others will not erect hotel in Kansas City, as recently reported.

S. C., Greenwood. — Cothran & Cothran, Greenwood, will have plans ready in about six weeks for extension to Oregon Hotel; 90x130-foot lot; three stores on first floor; 48 bedrooms; dining-room and kitchen, third floor; steam heat; one passenger and one freight elevator; all correspondence to be addressed to architects.

Tex., Boerne.—H. D. Barnits, San Antonio, Tex., and associates will remodel Boerne Hotel and erect 50-room addition; estimated expenditure, $50,000.

Tex., Stamford.—Stamford Townsite Co. awarded contract to J. R. Marr of Stamford to erect 22-room addition to Stamford Inn. (Recently noted.)

Tex., San Antonio.—Silva Heimann will erect 50-room addition to Imperial Hotel at cost of $15,000; plans being prepared by Atlee B. Ayres, San Antonio, Tex.

Tex., Texas City.—Texas City Co., A. B. Wolvin, president, Duluth, Minn., plans to erect hotel at cost of about $100,000; reinforced concrete.

Va., Norfolk.—MacDonald & Co. will rebuild Stag Hotel; will install plate-glass front; cost of improvements, $10,000; steel work for front by Etna Iron Works, Norfolk; plans by B. F. Mitchell, Norfolk; construction by R. W. MacDonald.

Tex., San Antonio.—I. M. Putnam of Oklahoma City will expend about $1,000,000 in improvements to Hot Wells Hotel, which will include increasing capacity to 500 rooms, enlarging bathhouse, constructing artificial lake for electric launches, etc.

MISCELLANEOUS STRUCTURES

Ala., Mobile — Infirmary. — Non-Sectarian Infirmary Association, Mrs. C. J. Torrey, president, is proceeding with erection of proposed infirmary.

D. C., Washington—Clubhouse.—Columbia County Club, J. S. Stoddard, 22d and P Sts., chairman building committee, will open bids February 1 for erection of proposed clubhouse; frame and plaster; steam heat; electric lighting; cost within $60,000; plans by F. B. Pyle, 1008 F St. N. W., Washington.

D. C., Washington—Clubhouse.—Army & Navy Club, 1622 I St. N. W., will erect clubhouse at 17th and I Sts. N. W.; site 148x106 feet, seven stories.

Fla., Tampa—Business.—Crenshaw Bros. will erect brick business block; 87x86 feet; divided into two storerooms and cold-storage room with capacity for five carloads; pressed brick; cost $30,000.

Fla., Tampa—Stable.—A. R. Swann has plans by Shaw & Jay, Tampa, for two-story brick stable; 210x37 feet; cost $15,000; W. P. Bethea, Tampa, contractor.

Ga., Atlanta — Store. — Parks-Chambers-Hardwick Company organized with Lloyd Parks, president; Edgar Chambers, vice-president; John W. Hardwick, secretary-treasurer; purchased establishment of M. R. Emmons Company and will expend $25,000 for remodeling and improving building; will install panel-glass show windows, etc.

Ga., Reynolds—Stores.—W. M. Musselwhite, president Farmers and Merchants' Bank, will erect three stores; 26½x50 feet; concrete construction; bids opened.

La., Slidell—Sanitarium.—Louisiana Anti-Tuberculosis League, New Orleans, La., will erect buildings consisting of 40x60-foot main building and 12 two-room cottages; ordinary frame construction; stoves; cost about $6000.

Md., Baltimore—Store.—Mrs. Kate Ashton awarded contract to Harry H. Brown, 109-111 Clay St., Baltimore, for store and warehouse at 114 West Lexington St.; 22x107 feet; slag roof; first floor most plate glass; cost $15,000.

Md., Baltimore—Store.—Cohen & Hughes have plans by Otto G. Simonson, American Bldg., Baltimore, for store building at 315 North Howard St., to replace structure previously reported burned; cost $7000; contractors estimating include Wm. H. Porter & Son, 505-507 Forrest St.; Henry Smith & Sons Company, 116-120 South Regester St.; Israel Griffith, 21 Builders' Exchange; John F. Kunkel, 413 King St.; M. F. Wright and John Cowan, 106 West Madison St., all of Baltimore.

Md., Baltimore.—J. Henry Miller, 110 Dover St., will erect business building at Eutaw and Franklin Sts.; four stories; 127x75.1x90.8 feet; plans by C. M. Anderson, 324 North Charles St., Baltimore.

Md., Reisterstown — Hospital. — Jewish Home for Consumptives, Westminster Pike, near Reisterstown, will erect building to accommodate 10 patients; Louis P. Hamburger, president, 1207 Eutaw Pl., Baltimore, Md.

Md., Shippensburg—Store.—Wm. E. Reddig will erect store building to replace structure reported burned; loss $30,000.

Miss., Vicksburg — Hall. — Knights of Pythias had plans prepared for proposed hall by W. A. Stanton, Vicksburg; three-story structure; 73x125 feet; steam heat (Warren-Webster system); electric lighting; date of opening bids not determined; cost $40,000. Address Architect.

Miss., Meridian—Hospital.—R. L. Turner has plans by Stuart Burt, Rosenbaum Bldg., Meridian, for hospital recently mentioned; two stories; 43x90 feet; brick, covered with slate or asbestos; steam heating; electric and gas lighting; cost $9000; will probably open bids by February 1.

N. C., Rocky Mount—Association.—Atlantic Coast Line Railroad, E. B. Pleasants, chief engineer, Wilmington, N. C., will erect Young Men's Christian Association building; two stories and basement; frontage 120 feet; brick; cost $20,000.

Okla., El Reno—Barn.—Welter Bros. are having plans prepared for erection of barn 50x100 feet.

Okla., Heavener—Business.—G. L. Lochridge, care of Lochridge Dry Goods Co., Mena, Okla.; O. C. Burns, J. M. Young and R. L. Walker are interested in erection of business buildings.

Okla., Muskogee—Business.—Earl Wright, Coweta, Okla., will build three-story business block at C and Callahan Sts.; 60x100 feet; brick.

Okla., Muskogee—Business.—Roland Spence of Norris City, Ill., will let contract for brick business building; three stories; 50x100 feet.

Okla., Muskogee—Business.—M. R. Williams and D. H. Middleton will erect two-story business block at Main and Court Sts.

Okla., Muskogee—Jail.—Muskogee.—County will erect jail building. Address County Commissioners, J. L. Brotherton, chairman.

Okla., Muskogee—Store.—Geo. A. Murphey, A. C. Trumbo and Thos. P. Smith will erect five-story building on Okmulgee Ave. for Smith-Bass Furniture Co.; brick, stone and steel; to cost $60,000.

Okla., Pittsburg (not a postoffice)—Store. C. Bond, Lawrenceburg, Ky., awarded contract to W. E. Vorhees, McAlester, Okla., for erection of store building; brick.

S. C., Spartanburg — Association.—Young Men's Christian Association purchased site 47 feet 9 inches by 163 feet, and will erect building; J. Wright Nash, J. W. Alexander and T. A. Green, building committee.

S. C., Williamston—Stores and Postoffice.—W. K. Hudgens, Pelzer, S. C., is receiving bids on erection of proposed 18x50-foot postoffice building at Williamston; brick, steel and plate-glass construction; plans by Sayre & Baldwin, Anderson, S. C.; Mr. Hudgens will also build three new fronts in storerooms; contract awarded to Le Croy & Johnson, Anderson; total cost of these buildings, including postoffice structure, about $4000.

Tenn., Bristol—Hospital.—Kings Mountain Memorial Hospital Association will probably erect hospital building; cost $10,000.

Tenn., Memphis—Hospital.—Sisters of St. Joseph's Hospital will award contract for erection of annex to hospital building; three stories and basement; brick; 50x80 feet; plans by Jones & Furbringer, Memphis.

Tenn., Nashville — Hospital. — George W. Hubbard Hospital Association, J. C. Napier, president, proposes erection of hospital building at Meharry College; cost $40,000.

Tenn., St. Elmo—Business Building.—Chattanooga Medicine Co. awarded contract to Adams & Schneider, 120½ East 8th St., Chattanooga, Tenn., for erection of $15,000 brick building previously described; plans by Downing & Pringle, James Bldg., Chattanooga; two-story 56x120-foot structure with composition roof; concrete basement floor; hard-pine interior finish; steam heat; electric lighting; to be occupied by postoffice and by Chattanooga Stock Medicine Co.

Tex., Brady—Business.—C. W. L. Schaeg purchased site 100x100 feet and will erect business building.

Tex., Dallas—Business.—J. D. Wheelan purchased site 90x96 feet and will erect two-story brick business building.

Tex., El Paso—Business.—Melvin Meat Co will erect business building; six stories; reinforced concrete.

Tex., Houston—Business.—M. F. Kettler will erect business building; five stories; fireproof.

Tex., Kingsville—Store.—E. O'Brien will rebuild store building recently reported burned; frame; 18-foot ceiling; cost $4000; plans and erection by J. D. Lucas & Son.

Tex., Kingsville—Stores.—Kingsville Pharmacy has not yet set date for opening bids for erection of two stores recently reported burned; offices above; 50x80 feet; fireproof construction.

Tex., San Antonio.—G. Bedell Moore is having plans prepared by Atlee B. Ayres, San Antonio, for addition to Moore Building; two stories; 116x119 feet; brick, with terra-cotta facing; steel-frame construction; cost over $100,000; will later erect 10 additional stories.

Va., Norfolk—Business.—R. W. MacDonald will expend $8000 in improvements to business building.

W. Va., Charleston—Clubhouse.—Tygarts Valley Club organized with Earl H. Smith, president; will erect clubhouse; bungalow type; will install small water system, sewerage and electric lights.

W. Va., Moundsville.—Fostoria Glass Co. will erect addition to plant for office and display-room purposes; three stories; brick; cost $25,000.

W. Va.—Sistersville—Store.—C. E. Shupbach will erect four-story store building.

MUNICIPAL BUILDINGS

La., Algiers, Station A, New Orleans—Market.—Bids will be received by undersigned for building of public market in Fifth district (Algiers) until January 10; plans and specifications with Kleinkemper & Crespo, Alix and Verret Sts., Algiers, or at City Engineer's office, City Hall.

Md., Hyattsville—Fire Station.—City will soon award contract for erection of brick building to contain municipal offices, fire station, etc. Address The Mayor.

Tenn., Memphis—Comfort Station.—L. M. Desaussure, secretary Park Commission, will receive bids until January 10 for construction of comfort station in Court square; plans and specifications may be seen at office of secretary; certified check, $250. (Recently mentioned.)

La., New Orleans—Public Baths.—Michael Cheese & Co., New Orleans, is lowest bidder at $10,740 for erection of proposed public baths.

Md., Baltimore—Engine-house.—Bidders on erection of engine-house No. 36 at Edmondson Ave. and Bentalou St. include Patrick J. Cushen, Law Bldg.; James F. Farley, Franklin Bldg.; Frederick Decker & Son, 1209-1211 East Biddle St.; Piel Construction Co., Equitable Bldg., and John Hiltz & Sons Company, 3 Clay St., all of Baltimore; bids to be opened January 5; plans by Ellicott & Emmart, Union Trust Bldg. (Recently mentioned.)

Okla., Oklahoma City—Fire Station.—Bids will be received at office of Bob Parman, City Clerk, until January 17 for construction of Stonewall St. Fire Station; plans and specifications on file in office of City Clerk and of Building Commissioner; each bid to be accompanied by certified check in sum of 3 per cent. of amount bid.

Va., Norfolk—Fire Station.—Board of Control rejected all bids for remodeling Queen St. fire station; appropriation $10,000; plans by Ferguson & Cairow, Norfolk, Va. (Recently mentioned.)

RAILWAY STATIONS

Tenn., Chattanooga.—Central of Georgia Railway, C. K. Lawrence, chief engineer, Savannah, Ga., will expend $25,000 in erection of freight station recently noted; 46x239 feet; ordinary construction; date of opening bids not fixed.

Tex., Alvin.—Gulf, Colorado & Santa Fe Railway, C. F. W. Felt, chief engineer, Galveston, Tex., will erect passenger station; 100x40 feet; concrete and pressed brick; construction begun.

Va., Fredericksburg. — Richmond, Fredericksburg & Potomac Railroad awarded contract to E. G. Heflin of Fredericksburg to erect passenger station; 30x90 feet; ordinary construction; steam heat; electric lighting; cost $25,000. (See "Machinery Wanted.")

W. Va., Wheeling.—Baltimore & Ohio Railroad, A. M. Kinsman, chief engineer, Baltimore, Md., will erect freight depot.

SCHOOLS

Ala., Dothan.—City will soon advertise for bids on material and construction of proposed high-school building; R. W. Lizenby, City Clerk.

Ala., Tuscaloosa.—Tuscaloosa College and Conservatory of Music organized with $20,000 capital stock; Daniel Collier, president; Hope Hargrave, vice-president; B. B. Cooper, secretary-treasurer; will purchase Tuscaloosa Female College and erect building to replace burned structure.

Ga., Hazlehurst.—City will open bids about February 1 for erection of proposed brick school building; 119x66 feet; plans by Chas. Edward Choate, 629 Candler Bldg., Atlanta, Ga.

Ky., Midway.—R. S. Starks, chairman building committee, received bids until January 3 for erection of school; plans and specifications by E. Stambler, 16-17 Merrick Lodge Bldg., Lexington, Ky.

La., Ama.—School Board of St. Charles Parish, Hahnville, La., will receive bids until January 31 for erection of two-room school in Third ward of parish; bond for one-third amount of bid; Luther A. Youngs, president; T. B. Sellers, secretary.

La., New Orleans.—Broche & Lemonier, New Orleans, are lowest bidders at $16,150 for erection of proposed annex to McDonogh Nos. 2 and 3; two stories and basement.

Md., Baltimore. — St. Mary's Industrial School, Wilkins and Caton Aves., will erect additional building to cost $15,000; will construct new entrance to present structure and install new fire-escapes; Cardinal James Gibbons, president of board, 406 North Charles St.

S. C., Due West.—Erskine College will rebuild Wylie Home, recently reported burned; cost about $10,000.

S. C., Greenville.—Greenville Female College will erect $10,000 college building.

S. C., Greenville.—Furman University will erect $50,000 science hall.

S. C., Rock Hill.—Winthrop College is preparing to erect proposed $100,000 college.

Tenn., Chattanooga.—Hamilton County Industrial Commission will petition County Court for appropriation to erect additional building at Bonny Oaks Industrial; fireproof or semi-fireproof construction; S. D. McReynolds, County Judge.

Tenn., Henning.—City will issue $15,000 of bonds to erect school. Address The Mayor.

Tenn., Memphis.—City awarded contracts for proposed high school as follows: To Southern Blower Co., 176-178 Gayoso St., Memphis, at $28,000 for heating and ventilating; to National Regulating Co., 334 Dearborn St., Chicago, Ill., at $4500 for regulators; to Harstick Heating Co., Memphis, at $11,220 for power plant and switchboard, and to Electric Novelty Co., Memphis, at $6358 for electric wiring; plans by B. C. Alsup, Memphis; cost of building, $212,200.

Tex., Jacksonville.—J. E. McFarland, secretary School Board, will receive bids until January 24 for erection of school; certified check for $500; plans and specifications on file at office of A. O. Watson, architect, Austin, Tex., or of Mr. McFarland, Jacksonville.

Tex., Melissa.—Independent school district will open bids January 4 for erection of two-story brick school building recently noted; 64x80 feet; metal roof and shingles; plaster walls; heaters; lighting not decided; cost within $9000; plans by W. N. Osburn, Melissa.

Tex., Orange.—West Orange School District No. 14 had plans prepared by and awarded contract to J. C. Markwith, Orange, for erection of school building recently mentioned; two stories; brick; eight rooms; ordinary construction; cost $7000.

THEATERS

Md., Baltimore.—M. Millhauser, 1035 North Gay St., has plans by Theodore Wells Pietsch, American Bldg., Baltimore, for moving-picture theater at 1039-41 North Gay St.; two stores now on site will be remodeled and addition erected in rear; theater will be 90x26 feet; brick; stone trimmings; front trimmed with ornamental plaster; metal ceilings; seating capacity 240; contract will soon be awarded.

Md., Baltimore.—W. W. Riggins, 1826 West Lexington St., will remodel building at 2 and 4 South Stockton St. as moving-picture theater; 50x66 feet; seating capacity, 200; cost $2500; plans by F. E. Beall, 213 St. Paul St.

Miss., Pascagoula.—Estate of W. E. Frederic accepted plans for opera-house; B. J. Blethen will be manager.

Tex., Fort Worth.—Lyric Theater Co. incorporated with $12,500 by Gaines B. Turner, S. T. Morton and J. S. Phillips.

Tex., San Antonio.—T. L. Conroy is interested, it is reported, in erection of opera-house to cost about $300,000.

WAREHOUSES

Fla., Pensacola.—Gulf Steamship Co. will, it is reported, enlarge warehouse on Palafox Wharf so as to make it 200 feet long and two stories high.

Ga., Reynolds.—W. M. Musselwhite, president Farmers and Merchants' Bank, will erect warehouse 80x100 feet; concrete construction; bids opened.

Miss., Gulfport.—Gulfport Grocery Co., R. L. Simpson, secretary, will not at present erect building recently reported.

N. C., Wilmington.—W. E. Rowe has begun erection of proposed warehouse, 28x130 feet, on river front.

S. C., Charleston.—South Carolina Warehouse Corporation, Henry Buist, president, is progressing with construction of warehouses and compress system previously announced; has enclosed 7 3-10 acres land with retaining wall of reinforced concrete resting on piles 70 feet long; wharves and buildings will cover 5¼ acres; will have pierheads or wharf on creosoted piles 70 feet long, having area of 40,000 square feet, with capacity for 8000 bales of cotton; two sheds with area of 40,000 square feet each, constructed on 60-foot piles, first for uncompressed and second for compressed cotton; 2500-ton compress to occupy space between warehouses; five brick warehouses, each having capacity of 2200 bales cotton; Louis Y. Dawson, Charleston, is engineer in charge, and Simons-Mayrant Company, Charleston, is contractor; total expenditure, $150,000. (Previously mentioned.)

S. C., Spartanburg.—Muckenfuss Manufacturing Co. contemplates erecting brick warehouse. (See "Miscellaneous Manufacturing Plants.")

Va., Lynchburg.—Lynchburg Foundry Co., H. E. McWane, president, will rebuild office and storage depot reported burned at loss of $35,000.

W. Va., Martinsburg.—Kilbourn Knitting Machine Co. will erect storage building; 149 feet long and 59 feet wide; brick; two stories and basement; slate roof. George W. Buxton of Martinsburg has contract for excavating.

RAILROAD CONSTRUCTION

RAILWAYS

Ala., Birmingham.—Concerning the report that the Southern Railway would build a detour line between Birmingham and Parrish, Ala., an officer writes that surveys were made a number of years ago for a line from near Thomas to Parrish, Ala., but he has heard nothing about building it.

Ark., Van Buren.—The Fort Smith, Van Buren & Interurban Light & Traction Co., capital $10,000, is reported organized to build a line through Crawford, Franklin, Johnson, Madison, Newton, Boone and Searcy counties. Preliminary survey is made in Crawford county and right of way secured from Van Buren to Mulberry. W. F. Keller is president; L. W. Burgett, vice-president; T. A. Bayley, secretary; S. A. Pernot, treasurer, and S. R. Chew, attorney. Other incorporators are J. L. Rea, W. F. Blocker and R. A. Clarkson of Fort Smith; Frank Woolum, L. F. Sherwood, Henry Kibler, J. H. Keller and N. E. Waite. A later dispatch says that construction has begun three miles east of Van Buren.

Ga., Hawkinsville.—Howard E. Coates, attorney, is reported as saying that the Hawkinsville & Western Railroad Co., which recently applied for a charter, proposes to build about 50 miles of line from Hawkinsville to either Perry or Fort Valley, Ga.; capital $100,000. An old roadbed 15 miles long will be used for part of the route. The road will work in connection with the Southern Trust Co. of Hawkinsville, in which the same parties are interested, and which will develop farming lands. The incorporators include T. B. Ragin and others of Pulaski county, E. B. Lewis of Montezuma, Ga., and others of Vienna, Unadilla, Delko, etc.

Ga., Tallulah Falls.—Louis B. Magid, president of the Piedmont Power Co., 1014-34 Candler Bldg., Atlanta, Ga., denies the press report that he is interested in a proposed electric street railway at Tallulah Falls.

La., Lake Charles. — Reported that the Frisco system will build a line from Lake Charles to Kinder, La. M. C. Byers is chief engineer at St. Louis, Mo.

La., New Iberia.—A dispatch says that the New Iberia & Northern Railway has been completed from Port Barre to New Iberia, about 42 miles. The Frisco and the Gould systems are interested. F. M. Welch is president; Jules Dreyfus, treasurer, and A. B. Romero, secretary, of the new line.

La., Shreveport.—The Louisiana & Arkansas Railroad, which has completed its line to Shreveport, is reported to have begun operation.

La., Shreveport.—The Kansas City Southern Railroad Co. is reported contemplating the construction of an extension from Shreveport, La., to Jefferson, Tex., to reach iron-ore mines. A. F. Rust is resident engineer at Kansas City, Mo.

Mo., St. Louis.—The Rock Island system, it is reported, will expend several millions for improving the St. Louis, Kansas City & Colorado Railway from St. Louis to Kansas City, which it acquired several years ago. J. B. Berry is chief engineer at Chicago, Ill.

Miss., Hazlehurst.—The Mississippi Western Railroad Co. is reported to have changed its name to the Mississippi & Western Railroad Co. J. W. Hudson is president, and C. F. Schofield, secretary, at Hazlehurst, Miss. It is announced that everything is ready to begin construction in January.

N. C., Charlotte.—Concerning the report that the Atlantic Coast Line would survey for a line from Charlotte to Monroe, N. C., and thence to McBee and Hartsville, S. C., with a cross line from Monroe to Wadesboro, N. C., an officer writes that only a reconnaissance is in progress, and no location nor plans have been made as yet.

N. C., Charlotte.—An officer of the Southern Railway says he has no knowledge of any plan to build a short cutoff near Charlotte. This refers to a recent press report.

N. C., Lumberton.—The Lumberton & Elizabethtown Railway Co., capital $250,000, has been chartered to build a line 25 miles long connecting the two points named in North Carolina. Grading is to begin immediately. The stockholders are George B. McLeod, Alfred H. McLeod, W. P. McAllister, J. A. McDougald and F. A. Bond.

N. C., Rockingham.—Mayor W. N. Everett writes that the Rockingham Railroad Co. proposes to build a line from Rockingham via "all the cotton mills" to Gibson Station to connect with the Atlantic Coast Line; distance about 20 miles. J. P. Leak is president, and J. LeGrand Everett, treasurer and secretary.

N. C., Waynesville.—The South Atlantic Transcontinental Railroad Co. is reported to have authorized an issue of $50,000,000 of first mortgage bonds to be floated in France for its proposed line from the Tennessee coal fields via Waynesville, Asheville and other points to some port on the Atlantic Coast. Col. S. A. Jones of Waynesville is president, and among others on the staff of officers are H. R. Nickerson of New York, A. H. Beary of the same city, C. J. Harris of Dillsboro, N. C., and Dr. E. B. Glenn of Asheville, N. C.

Okla., Miami.—The Oklahoma, Kansas & Missouri Interurban Railway Co., writes an official, will build in 1910 a line from Hattenville to Joplin, Mo., 31 miles, and that a proposed line is from Miami to Bartlesville, Okla. Franklin M. Smith, Miami, Okla., is president.

Okla., Texhoma.—Vice-President William R. Evans of the Denver & Gulf Railroad Co. writes that construction has been resumed and it is desired to purchase ties, 70-pound relaying rails and a locomotive of about 50 tons.

S. C., Anderson.—Commission is granted to the Greenville, Spartanburg & Anderson Railway Co., backed by J. B. and B. N. Duke of Duram, N. C., to build an interurban electric railway connecting Anderson, Belton, Greenville and Spartanburg. The line already reaches from Anderson to Belton, 10 miles, and the route will be from that point via Williamston, Pelzer, Piedmont and Gannt to Greenville, and thence via Taylor, Greer, Pelham, Duncan, Reidville, Wellford, Lockhart, Fairforest and Spartan Mills to Spartanburg, making altogether 64 miles. Besides the Messrs. Duke, the incorporators include Ellison A. Smyth and Lewis W. Parker, H. J. Haynesworth and W. J. Thackston of Greenville, S. C. The road may ultimately be extended from Spartanburg via Union, Laurens and Greenwood to Belton, thus making a belt line.

S. C., Greenville.—The Greenville & Spartanburg Railway Co., which proposes to build an interurban electric railway from Greenville to Spartanburg, S. C., about 30 miles, has been granted a new commission with the same incorporators—Charles W. Ellis, H. H. Prince and O. K. Mauld of Greenville; capital $100,000.

Tenn., Memphis.—The charter amendment of the Clarksdale, Covington & Collierville Interurban Railway Co. includes not only projected extensions in Memphis, but lines, as before reported, to Lakeview, Miss.; Middleton, Tenn., and Jackson, Tenn., via Covington and Brownsville. W. W. Hayden of Memphis is chief engineer.

Tenn., Nashville.—The contemplated extensions of the Tennessee Central Railroad Co., according to a report, will be eastward from Harriman to Knoxville, Tenn., and westward from Hopkinsville, Ky., to Thebes, Ill., crossing the Ohio on a new bridge and connecting at Thebes with the Thebes bridge. L. F. Lonnbladh is chief engineer at Nashville, Tenn.

Tex., Abilene.—The Abilene Central Railway Co. is reported to have filed its charter to build a railroad from Abilene to Waco, Tex., about 150 miles; capital $150,000. Morgan Jones of Abilene, Tex., is interested.

Tex., El Paso.—The San Diego, El Paso & St. Louis Railroad Co., which proposes to build a line from El Paso, Tex., to Artesia, N. M., 197 miles, will, it is now reported, continue its line from Artesia to either Quanah or Vernon, Tex., about 500 miles. P. A. McCarthy of Houston, Tex., is chief engineer, and A. Courchesne of El Paso, Tex., is president.

Tex., Galveston.—The Gulf, Colorado & Santa Fe Railway, it is reported, contemplates building a new roundhouse, machine shops and turntable at Galveston. F. Merritt is chief engineer at Galveston, Tex.

Tex., Galveston.—An officer of the Gulf, Colorado & Santa Fe Railway says that the improvements contemplated on the San Angelo branch are revision of grade and widening of roadbed between Temple and Brownwood, for which $117,000 is authorized. There is also an appropriation of $240,000 for ballasting this branch with rock, 55½ miles, between the same points. F. Merritt, Galveston, Tex., is chief engineer.

Tex., Greenville.—Joseph F. Nichols, Mayor of Greenville, is reported to be organizing a company to build a railway from Greenville to Wolfe City, and possibly thence to Clarksville; also from Greenville to Piano, Tex.

Tex., Henrietta.—The Southwestern Railway Co. is reported to have let contract for its extension from Scotland to Archer City, 10 miles, to the Grigsby Construction Co. of Houston, Tex.

Tex., Houston.—R. H. Baker, president of the Trinity & Brazos Valley Railway, will, it is reported, resign February 1 and devote attention to some new railroad enterprises which he has in view.

Tex., Kingsville.—President B. F. Yoakum of the St. Louis, Brownsville & Mexico Railway is quoted as saying that $400,000 will be spent for ballasting and that other improvements will be made by the railroad company. E. C. Burgess is engineer of construction at Kingsville, Tex.

Tex., Laredo.—C. M. Fish and J. C. Reister are reported securing rights of way for the proposed railroad from Laredo to Sam Fordyce, about 135 miles. Mr. Fish is quoted as saying that St. Louis capital is behind the enterprise and it is expected to begin construction by February 1. His address is Laredo, Tex.

Tex., Marshall.—Reported that B. F. Yoakum is interested in the Marshall & East Texas Railway, and that it will be extended northward immediately to connect at Paris, Tex., with the Frisco system. R. J. Lockwood is chief engineer at Marshall, Tex.

Tex., Mobeetie.—Survey for the American Central Railway from Miami to Vernon, Tex., is reported begun by the Central Construction Co.; capital $50,000; F. P. Reid and M. F. Johnson of Mobeetie are interested.

Tex., Roby.—President W. A. Butts of the Estacado & Gulf Railway is reported as saying that the line is financed and work will be resumed to complete the road from McCauley to Roby. Only four miles remain to be constructed, but it is proposed to build this year about 100 miles more.

Tex., Wichita Falls.—The Wichita Falls Route, it is reported, will extend its northwestern line from Elk City, Okla., into Kansas, and will also build from Altus, Okla., to Wellington, Tex. Frank Keil, general manager, is quoted as saying that the company will also extend from Newcastle to Cisco or Fort Worth, Tex. R. A. Thompson is chief engineer at Wichita Falls, Tex.

Va., Big Stone Gap.—R. T. Irvine, attorney, of Big Stone Gap, is reported as saying that coal operators and others are promoting a plan to build an electric railway connecting various towns in that region.

Va., Cape Charles City.—The New York, Philadelphia & Norfolk Railroad Co. is reported to have let contract for double-track-

ing about 50 miles of line to Eyre, Shoemaker & Co. This includes the widening of roadbed and bridges.

Va., Graham.—The C. L. Ritter Company is reported to have acquired the Yellow Poplar Lumber Co., and will build a railroad to Whitewood, Va. C. L. Ritter is president; Edwin Mann, secretary and vice-president; B. B. Burns, secretary and treasurer. Mr. Ritter's address is Huntington, W. Va.

Va., New Church.—An officer of the New York, Philadelphia & Norfolk Railroad Co. denies the report that it contemplated building a line between New Church, Franklin City or Stockton.

Va., Roanoke.—The Vaughan Construction Co. at Roanoke is reported to have been given a contract by the Seaboard Air Line to reconstruct the Roper tunnel that was recently damaged by fire.

STREET RAILWAYS

Ga., Waycross.—Burdett Loomis of the Loomis-Pettibone Company, engineers, 2 Rector St., New York, writes in regard to the Waycross Street Railway that the company will be opened to proposals from anybody who wishes to build or help finance the line. Burdett Loomis, Jr., is engineer in charge. Address, Waycross, Ga.

N. C., Gastonia.—Construction, it is reported, will begin immediately on the Gastonia Electric Street Railway. W. S. Lee, vice-president and general manager of the Southern Power Co., and C. E. Hutchinson of Mt. Holly, N. C., are among those interested.

N. C., Lexington.—S. E. Williams and J. E. Foy have applied to the Board of Aldermen for a franchise for an electric street railway.

Tenn., Clarksville.—The Clarksville Railway & Light Co. is reported sold to a syndicate represented by E. L. Fischer of Danville, Ill., which will extend the line. W. M. Case is manager.

Va., Roanoke.—The Roanoke Railway & Electric Co., it is announced, contemplates building an extension of more than a mile to reach the lands of the Raleigh Court Corporation.

MACHINERY, PROPOSALS AND SUPPLIES WANTED

Manufacturers and others in need of machinery or supplies of any kind are requested to consult our advertising columns, and if they cannot find just what they wish, if they will send us particulars as to the kind of machinery or supplies needed we will make their wants known free of cost, and in this way secure the attention of manufacturers and dealers throughout the country. The Manufacturers' Record has received during the week the following particulars as to machinery and supplies wanted.

Air Compressor. — Mackie-Crawford Construction Co., F. E. Mackie, manager, Doty Bldg., Jacksonville, Fla., wants new or second-hand portable air compressor to drive pneumatic tools (six at once) on structural steel erection; also engine to drive compressor.

Automobiles.—See "Machinery, etc."

Blades.—M. P. Carpenter, Blytheville, Ark., wants prices on sharpened and punched blades for stalk cutters.

Boilers.—Chas. C. Brown, Bainbridge, Ga., wants boilers. (See "Sawmill.")

Brick Machinery.—Cookville Coal & Lumber Co., Mt. Pleasant, Tex., wants pressed-brick plant for building, face and paving brick.

Bridge.—Sealed proposals for constructing reinforced concrete arch bridge across Medina River at Pleasanton Road Crossing will be received by Commissioners' Court of Bexar County, at Courthouse, San Antonio, Tex., up to 12 noon January 20; structure to consist of two 110-foot spans and two 30-foot spans carrying 18-foot roadway; will contain approximately 850 cubic yards of reinforced concrete and 1600 cubic yards of rubble concrete. Proposals must be accompanied by certified check for $500, payable to County Judge of Bexar county. Plans and specifications on file at Courthouse, San Antonio; at the office of Engineering-Contracting Co., Chicago, and at office of Bartlett & Ranney, civil engineers, San Antonio. Additional copies may be obtained from latter at $2.50 per set; Thos. E. Ramsey, County Auditor.

Broom Machinery. — H. V. Watts, San Benito, Tex., wants names and addresses of manufacturers of broom machinery.

Building Material. — E. G. Heflin, Fredericksburg, Va.,* wants prices on building material for $25,000 railroad passenger station.

Building Materials.—J. R. Henson, pastor M. E. Church South, Quanah, Tex., wants prices on building materials for $45,000 edifice.

Bulldozer. — Senn Manufacturing Co., Edward Senn, president, Birmingham, Ala., wants bulldozer, No. 4, to be operated by electric drive.

Cars. — John M. Greene, Drexel Bldg., Philadelphia, Pa., wants a number of 10-yard two-way, standard-gauge, diamond-frame dump cars; second-hand.

Cars.—Southern Equipment Co., Houston, Tex., wants dealers' prices on 30 36-inch-gauge and 20 standard-gauge logging cars.

Cars.—Pennsylvania Equipment Co., 1209 West End Trust Bldg., Broad St. and South Penn square, Philadelphia, Pa., in market for 36-inch-gauge flat cars; 15 to 20 tons capacity for export; prices must include knocking down in export shape alongside steamer, New York.

Cars.—Huettel Coal & Coke Co., E. H. Ould, president, Norton, Va., wants mine cars.

Cement.—C. B. Shaffer, 203 Botetourt Apartments, Norfolk, Va., wants prices on cement.

Compressed-air Machinery.—Huettel Coal & Coke Co., E. H. Ould, president, Norton, Va., wants prices on compressed-air cutting and haulage machinery.

Concrete Arch Bridge.—See "Bridge."

Concrete Mixer.—E. G. Heflin, Fredericksburg, Va., wants prices on concrete mixer.

Conveyor.—Ashland Fire-Brick Co., Ashland, Ky., in market for short conveyor for ground fire-clay.

Cotton-rope Machinery. — W. W. Cooper, Flowery Branch, Ga., wants data and prices on machinery for manufacturing rope and twine.

Dowel Machine.—Ronda Coop & Egg Case Co., Ronda, N. C., wants rod or dowel machine for turning rods from hickory (7-16-inch).

Drykilns. — Chas. C. Brown, Bainbridge, Ga., wants drykilns. (See "Sawmill.")

Electric Conduits and Wiring.—See "Government and State Buildings" under Miss., Meridian, and Ark., Hot Springs.

Electric Plant.—City of Tishomingo, Okla., W. H. Bingham, president Board of Trustees, wants electric plant to furnish light, heat and power; to be operated by water-power of about 75-horse-power capacity; capacity of plant, 1000 to 1200 incandescent or 15 arc lights; about 15 miles of wire.

Electrical Machinery.—Sumter Telephone Manufacturing Co., Sumter, S. C., wants 75-kilowatt D. C. generator and 25 to 30-horse-power electric motor.

Electrical Machinery.—See "Building Notes" under Fla., Fort Barrancas.

Electrical Machinery. — Southern Illinois Manufacturing Co., Jonesboro, Ill., wants small lighting dynamo and engine.

Electrical Machinery.—See "Ice Machinery."

Electrical Machinery. — Huettel Coal & Coke Co., E. H. Ould, president, Norton, Va., wants prices on electrical cutting and haulage machinery.

Electric Lighting.—Office of Constructing Quartermaster, Washington, D. C. (Takoma Substation). Proposals will be received until January 29 for extension of electric-lighting system at Walter Reed Army General Hospital, Washington, D. C.; information on application; plans and specifications may be seen at above office; deposit of $10 required to insure safe return of plans loaned; proposals to be addressed to Capt. H. L. Pettus, Constructing Quartermaster.

Engine.—See "Air Compressor."

Engine.—Hammond Ice, Light and Bottling Works, Ltd., Hammond, La., in market for 60-horse-power center-crank horizontal automatic engine of standard make for electric generating; second-hand preferred.

Engines.—Chas. C. Brown, Bainbridge, Ga., wants engines. (See "Sawmill.")

Filling and Grading.—Bids will be received January 20 for filling with river sand and grading of Newcomb grounds as per plan on file in office of board of administrators of Tulane Educational Fund, Joseph A. Hincks, secretary, 508 Tulane-Newcomb Bldg., 211 Camp St., New Orleans, La.

Filter.—City of Tishomingo, Okla., wants prices, etc., on filter for installation at dam.

Forgings. — Success Machinery Co., 213 Canal-Louisiana Bank Bldg., New Orleans, La., wants addresses of manufacturers of drop forgings.

Fountain Pens.—V. A. Dunn, 908 Broadway, Nashville, Tenn., wants addresses of manufacturers of fancy pearl-handled fountain pens.

Glass Machinery.—Cookville Coal & Lumber Co., Mt. Pleasant, Tex., wants to correspond with manufacturers of glass-making machinery.

Grinding and Polishing Machinery.—Senn Manufacturing Co., Edward Senn, president, Birmingham, Ala., wants grinding and polishing machinery.

Handle Machinery. — N. B. Handy Company, Lynchburg, Va., wants machinery for manufacturing mallet handles.

Handle Machinery.—See "Metal Presses."

Handle Lathe.—Senn Manufacturing Co., Edward Senn, president, Birmingham, Ala., wants lathe to turn oval handle 40 inches long. (Ober preferred.)

Hardware.—See "Machinery, etc."

Heating Plant.—See "Building Notes" under Fla., Fort Barrancas.

Heating Apparatus.—See "Government and State Buildings" under Miss., Meridian, and Ark., Hot Springs.

Hoist.—Pennsylvania Equipment Co., 1209 West End Trust Bldg., Broad and South Penn Square, Philadelphia, Pa., in market for electric or steam crab without drums, two nigger heads on each side, about 8¼x10 inches; no boiler.

House Furnishings.—See "Machinery, etc."

Hoisting Machinery.—Port Arthur Export Co., Port Arthur, Tex., is interested in purchase of hoisting machinery, operated by electrical power, for unloading timber from railroad cars into water; track located on water-front.

Ice Machinery.—Marble Falls Ice & Cold Storage Co., W. H. Hoag, manager, wants prices on ice machinery to be operated from A. C., 220-volt, 3-phase, 60-cycle circuit.

Ice Plant.—Thos. M. Swift, Jr., Elberton, Ga., wants data and prices on ice and cold-storage plant of 20 to 25 tons capacity.

Ice-cream Machinery.—R. A. Bowers, superintendent Pascagoula Street Railway & Power Co., Scranton, Miss., wants prices and specifications on equipment for ice-cream plant; daily capacity, 300 gallons.

Ice Machinery.—H. V. Watts, San Benito, Tex., wants names and addresses of manufacturers of ice machinery.

Implement Parts.—M. P. Carpenter, Blytheville, Ark., wants prices on angle iron punched and harrow teeth.

Lighting System.—M. Schroeder, 3327 South Jefferson Ave., St. Louis, Mo., wants data and prices on lighting system for farm homes; contemplates equipment that can be used in connection with cook stoves.

Light Fixtures. — Treasury Department, office of Supervising Architect, James Knox Taylor, Washington, D. C. Sealed proposals will be received until January 3 for supplying light fixtures for United States public building at Greenville, Miss., in accordance with department's drawings and specifications. Telegraphic bids or modifications of bids will not be considered. Each proposal must be accompanied by certified check for 10 per cent. of aggregate amount thereof, drawn to order of Treasurer United States.

Linoleums.—George S. Beachley, Middletown, Del., wants addresses of manufacturers of inlaid linoleums 12 feet wide.

Lithograph Equipment.—See "Machinery, etc."

Locomotive.—Denver & Gulf Railroad Co., Wm. R. Evans, vice-president, Texhoma, Okla., wants quotations on locomotive; about 50 tons.

Locomotives. — Pennsylvania Equipment Co., 1209 West End Trust Bldg., Broad St. and South Penn square, Philadelphia, Pa., in market for two 36-inch-gauge four-wheel saddle-tank engines, 9x14 inches or 10x16 inches; knocked down in export shipping shape, delivered alongside steamer, New York.

Locomotives. — Southern Equipment Co., Houston, Tex., wants dealers' prices on one 36-inch-gauge and one standard-gauge geared locomotives.

Machine Tools.—Southern Equipment Co., Houston, Tex., wants dealers' prices on 24-inch second-hand drill press, 18-inch turret lathe (for brass) and 14 or 16-inch second-hand shaper.

Machinery, etc.—M. Carlo, Porta Galata, Omar Abed Han, third floor, 3d eme Etage, Constantinople, Turkey, invites consignments of automobiles, house furnishings, hardware, paper, machinery of every kind, paints, type, typewriters, lithograph equipment, etc.

Metal Presses.—Brown Wrench Co., Ronceverte, W. Va., wants machinery for manufacturing monkey wrenches.

Mine Cars.—See "Cars."

Miscellaneous Supplies. — Department of Public Improvements, subdepartment of City Engineer, Baltimore, Md. Separate sealed proposals marked "Proposals for Lumber," "Proposals for Sand," "Proposals for Cobble or Rubble Paving Stone and Broken Stone," "Proposals for Vitrified Paving Blocks," "Proposals for Vitrified Sewer Pipe," "Proposals for Asphalt Blocks," "Proposals for American Portland Cement," "Proposals for Curbstone, Gutterstone and Flagstone," "Proposals for Granite Paving Blocks," "Proposals for Sidewalk and Sewer Brick," "Proposals for Sheet Asphalt Repairs for Whole City," "Proposals for Tools and Hardware," "Proposals for Paints, Oils, etc.," "Proposals for Coal," "Proposals for Sewer Traps," "Proposals for Inlet Covers and Dripstones of North River Bluestone," "Proposals for Square and Oval Cast-Iron Manhole Frames and Covers," "Proposals for Cast-iron Inlet Covers," "Proposals for Road Gravel, Washed Concrete Gravel and Washed Filler Gravel" for general purposes in City Engineer's Department during 1910 will be received, addressed to Board of Awards, care of J. Sewell Thomas, Register, at office of City Register, City Hall, until 11 A. M. January 12; certified check of bidder on clearing-house bank, drawn to order of Mayor and City Council of Baltimore for amount as recited in specifications, must accompany each bid. Specifications and blank proposal sheets can be had at this office upon application. Bids will be received for each kind of material above specified where bidder cannot furnish all materials named; B. T. Fendall, City Engineer.

Mallet Machinery.—N. B. Handy Company, Lynchburg, Va., wants machinery for manufacturing mallets.

Metal-working Machinery.—F. M. & T. K. Green, Liberty, S. C., want prices on machinery to make metal shingles, etc.

Monkey-wrench Machinery. — See "Metal Presses."

Oil Furnace.—Senn Manufacturing Co., Edward Senn, president, Birmingham, Ala., wants crude-oil furnace for heating steel; 3-inch or 4-inch by 30-inch opening.

Paints.—See "Machinery, etc."

Paper.—See "Machinery, etc."

Paving.—City of Homer, La., will open bids February 1 for construction of four miles concrete paving; engineer not yet employed; for specifications address G. G. Gill, Town Clerk.

Paving Blocks.—Geo. S. Powell, Asheville, N. C., wants data and prices on wood paving blocks.

Plow Parts.—M. P. Carpenter, Blytheville, Ark., wants prices on wood and steel beams, mold boards, handles, bars, shares and bolts for plows.

Plumbing.—See "Building Notes" under Fla., Fort Barrancas.

Plumbing and Gaspiping.—See "Government and State Buildings" under Miss., Meridian, and Ark., Hot Springs.

Power Plant. — Royal A. Farris, Dallas, Tex., wants information and prices on power plant for $60,000 office building.

Power Punch.—Hunt's Machine Shop, Somerset, Ky., wants second-hand power punch on which to fit dies to punch ¾x2-inch slot in ¾-inch slot in hot iron; condition of press not important.

Pneumatic Riveters.—Mackie-Crawford Construction Co., F. E. Mackie, manager, Doty Bldg., Jacksonville, Fla., wants pneumatic riveting tools with hose connection.

Punch and Shear. — Senn Manufacturing Co., Edward Senn, president, Birmingham, Ala., wants punch and shear; shear to cut 30 sheets; 24-inch throat; bed of punch to be 32 or 24-inch with 24-inch throat; to be operated by electric drive.

Punch and Shears.—Southern Equipment Co., Houston, Tex., wants dealers' prices on double-end punch and shears; capacity, one-half-inch hole in one-half-inch plate.

Rails, etc.—Denver & Gulf Railroad Co., Wm. R. Evans, vice-president, Texhoma, Okla., wants quotations on 70-pound relaying rails and ties.

Rails.—Southern Equipment Co., Houston, Tex., wants dealers' prices on 35, 40, 45, 56 and 60-pound relaying rails.

Rails.—Back Fork Lumber Co., Buckhannon, W. Va., in market for second-hand rails for logging railway; up to 65 pounds; also wants card of different rail weights.

Rails.—Pennsylvania Equipment Co., 1209

West End Trust Bldg., Broad St. and South Penn square, Philadelphia, Pa., in market for 500 to 1000 tons of 45-pound steel relayers with sufficient fishplate fastenings; price wanted per gross ton for export alongside steamer, New York.

Rails.—Huettel Coal & Coke Co., E. H. Ould, president, Norton, Va., wants 16-pound steel rails.

Reinforcing Rods.—C. B. Shaffer, 203 Botetourt Apartments, Norfolk, Va., wants prices on five-eighths-inch reinforcing rods.

Road Construction.—Sealed bids will be received at office of W. J. Parish, County Commissioner, Gordon, Ala., until March 15 for construction of 51 miles of graded roads in Houston county; plans and profiles at office of Probate Judge, Dothan, Ala.; copies sent upon request.

Roofing.—F. A. Skillman, Kenbridge, Va., wants prices on roofing.

Sand.—C. B. Shaffer, 203 Botetourt Apartments, Norfolk, Va., wants prices on sand.

Sawmill Dogs. — Hunt's Machine Shop, Somerset, Ky., wants description and prices on sawmill dogs.

Sawmill. — Chas. C. Brown, Bainbridge, Ga., wants saw and planing mills, drykilns, etc.; also engines and boilers.

Shafting and Pulleys.—Brown Wrench Co., Ronceverte, W. Va., wants prices on shafting and pulleys.

Slate and Tile.—Wise Granite Co., Union Trust Bldg., Washington, D. C., wants prices on green and red slate and roof tile.

Steam Shovel.—John M. Greene, Drexel Bldg., Philadelphia, Pa., wants a second-hand No. 0 Thew traction steam shovel.

Steel Products. — Success Machinery Co., 213 Canal-Louisiana Bank Bldg., New Orleans, La., wants addresses of manufacturers of pressed steel products.

Steel Forms.—Vaughan Construction Co., Vaughan Bldg., Christiansburg, Va., wants to correspond with manufacturers of collapsible steel forms for lining tunnels with concrete.

Stone.—C. B. Shaffer, 203 Botetourt Apartments, Norfolk, Va., wants prices on crushed stone.

Sewer.—Department of Interior, Washington, D. C. Sealed proposals in duplicate will be received until February 16 for construction of sanitary sewer system for north addition to city of Lawton, Okla., in accordance with drawings and specifications, copies of which, with form of proposal, may be had on application at department; certified check for $5 will be required as guaranty for safe return of plans loaned; plans and specifications may also be examined in office of Mayor of Lawton and of John D. Kennard, civil engineer, Lawton. Proposals must be securely enveloped, marked "Proposal for Construction of Sanitary Sewer, Lawton, Okla.," and be addressed to Secretary of Interior; Frank Pierce, first assistant secretary, Washington, D. C.

Sewer Construction.—Brownsville Sewerage Co., William Kelly, president, Brownsville, Tex., will open bids January 12 for construction of sanitary sewers. Approximate quantities are: Two intercepting pumps; corrugated-iron outfall pipe; 8998 linear feet 15-inch pipe sewer; 680 linear feet 12-inch pipe sewer; 5640 linear feet 10-inch pipe sewer; 8780 linear feet 8-inch pipe sewer, with appurtenances. Plans and specifications on file in office of president of company; of A. A. Gray, Houston St., San Antonio, Tex.; Judge Henry L. Borden, First National Bank Bldg., Houston, Tex., and A. F. Kirkpatrick, 375 Main St., Dallas, Tex.; proposals to be made on blanks to be had at office of president; certified check, $1000.

Sewer Construction.—J. J. Winne, Mayor, Weatherford, Okla., will receive bids until January 28 for construction of concrete septic tank of 84,000 gallons capacity; two sand-filter beds, 60x100 feet by 3 feet 3 inches; 32,450 feet of 6-inch, 9400 feet of 8-inch, 7770 feet of 10-inch, 4770 feet of 12-inch, 1450 feet of sewers of first-quality pipe, together with manholes, lampholes and other appurtenances; also for construction of water-works standpipe, etc.; certified check, 5 per cent. of bid; plans and specifications on file with and blanks may be obtained from W. K. Cunningham, City Clerk, Weatherford, or J. L. O'Hearn, consulting civil engineer, Clinton, Okla. (See "Water-works.")

Tanks.—Senn Manufacturing Co., Edward Senn, president, Birmingham, Ala., wants storage tanks for crude oil and for water.

Tile.—See "Slate and Tile."

Ties.—See "Rails, etc."

Tile.—P. H. Hovey, 220 Dwight Bldg., Kansas City, Mo., wants prices on 12x12x12 dense serrated tile for 12-room residence; construction, cement plaster on iron lath; 42x44-foot building; delivery, f. o. b. Kansas City.

Typewriters.—See "Machinery, etc."

Veneered Doors.—P. H. Hovey, 220 Dwight Bldg., Kansas City, Mo., wants prices on 50-2-8"x7-1¾ birch veneered doors, f. o. b. Kansas City.

Water-works.—J. J. Winne, Mayor, Weatherford, Okla., will receive bids until January 28 for construction of water-works standpipe 24 feet diameter by 40 feet high; 18-foot by 72-inch high-pressure boiler, return-tubular, full flush front; air-lift pumping system for five wells; duplex force pump of 900,000 gallons capacity; 36,000 feet of different size water mains, with valves, hydrants, etc.; also concrete septic tank for sewer system, etc. (For further particulars see "Sewer Construction.")

Wire Crimper.—Southern Equipment Co., Houston, Tex., wants dealers' prices on wire crimper for wire and flats up to one-half and one-and-one-half to two-and-one-half-inch mesh.

Wood Blocks (Paving). — See "Paving Blocks."

Woodworking Machinery. — See "Handle Machinery" and "Mallet Machinery."

Woodworking Machinery. — H. T. Smithdeal, Advance, N. C., wants second-hand automatic glue jointer and miter saw.

Woodworking Machinery.—See "Dowel Machine."

INDUSTRIAL NEWS OF INTEREST

Wants Land for Colonization.

James W. Draper & Co. are desirous of purchasing from 10,000 to 20,000 acres of land for colonization purposes. They contemplate Alabama, Georgia, North Carolina or Tennessee properties contiguous to railway. Messrs. Drape & Co. have offices at 512 Farmers' Bank Building, Pittsburg, Pa.

Northwestern Cement Products Association.

Owing to the illness of its president, Martin T. Roche, the Northwestern Cement Products Association has abandoned the plan to hold its sixth annual convention and cement show at St. Paul, and has arranged to meet during the period of the third annual show of the Cement Products Exhibition Co. in Chicago. The convention will be held February 18-21.

With the Triumph Electric Co.

L. H. Thullen, well known in electrical circles as a consulting engineer of New York city and as the originator of numerous commercial patents connected with the electrical industry, has recently accepted the position of chief engineer with the Triumph Electric Co., Cincinnati, Ohio. Mr. Thullen is a member of the American Institute of Electrical Engineers and of the American Society of Mechanical engineers.

Southern Contractors on Northern Work.

That Southern contractors have the facilities and are often successful in competitive bidding for contracts outside of Southern territory is evidenced by the fact that Scott Bros., general contractors of Lynchburg, Va. have secured their fourth contract on the New York State Barge Canal near Rome, N. Y., which amounts to $1,750,000. It is stated that this firm now has contracts aggregating $3,000,000, most of them being in New York State.

Wants to Interest Capital.

The owners of kaolin property near Rockingham, N. C., are desirous of interesting capital in its development. The deposits are red, white and yellow, located on 80 acres of land, and a 50-foot shaft has been sunk to test the deposit. It is understood there is little overburden, which insures mining the clay at a minimum cost. Correspondence addressed to "Kaolin," care of Manufacturers' Record, will be forwarded to the owners of the property.

Auction Sale of Machinery.

Announcement is made that public sales of machinery will be held by Schwab Bros. & Co., auctioneers, 601 Fidelity Bldg., Baltimore. The dates named are January 17, 18 and 19, at Leadenhall and Winder Sts., rear of 710 West Pratt St., and near corner Cold Spring Lane and Maryland & Pennsylvania Railway. The machinery includes engines, boilers, electrical equipment, pumps, filters, Nernst lamps, arc lamps, steel stack, tanks, etc. Catalogues may be obtained on application.

Recent "Ideal" Electrical Contracts.

The Ideal Electric Co., consulting and contracting engineer, Charlotte, N. C., has recently received some important electrical contracts in the Carolinas. Among these were the following: Wachovia Bank's eight-story office and bank building in Winston-Salem, N. C.; Cole Manufacturing Co., Charlotte, N. C., six large buildings; Belk Investment Co.'s department store at Charlotte, N. C., which will be six stories high and have over 500 electric outlets for lighting throughout by tungsten lamps; Hamer Cotton Mill, Hamer, S. C. Owing to increasing business and desire for better accommodations the Ideal Electric Co. has recently removed from Church street into a suite of offices in the Realty Building. Here the company is better equipped to handle all kinds of electrical contracts.

Conference of Agents and Department Managers.

The Minneapolis (Minn.) Steel & Machinery Co. held a conference of its district representatives and department managers on December 14, 15 and 16. Daily sessions were held, at which papers were read by G. L. Gillette, G. W. Pope, A. M. Burch, A. H. Allen, J. L. Record, R. P. Gillette, Joseph Garbett, E. Brozezinski, E. Leverton, J. R. Ware, Geo. L. Gary, E. F. Woodcock and E. A. Merrill. Each paper was followed by a general discussion of the subject presented. This is the first yearly meeting of this kind of the Minneapolis Steel & Machinery Co., and was attended by all salesmen from its various agencies.

The Burriss Metal Shingles.

Among Southern manufacturers whose products have been favorably received are John T. Burriss & Son, metal workers and manufacturers of metal shingles, Anderson, S. C. This is evidenced by the increasing demand for their shingles, to meet which the company is operating its plant at Anderson to its full capacity and has established several branch plants for their manufacture. Plants are located in Charlotte, N. C., and Decatur, Ala., manufacturing the Burriss metal shingles on royalty, and in the early part of next year the company will locate a plant in Atlanta, Ga., to manufacture under similar conditions. They have sold the privilege to manufacture their shingles in Oklahoma and are negotiating with several other companies to manufacture them on royalty. The Burriss metal shingles are said to combine all the qualities to make a watertight and serviceable roof, giving it a tile effect.

The Scott-Madden Iron Works Co.

The Scott Manufacturing Co. of St. Louis, Mo., has taken over Madden & Co. of Rushville, Ind., and will operate as the Scott-Madden Iron Works Co., with general offices in the Third National Bank Building, St. Louis. The Scott Manufacturing Co. manufactured the Andrus dry press-brick machinery, while Madden & Co. produced a line of mud machinery. The new company will continue to manufacture both the brick and mud machines, together with a line of machinery for making drain tile and accessories and supplies for brick plants. It has also facilities for manufacturing castings and machinery, and will solicit orders for special machinery for various purposes. The factories of the old companies at Keokuk, Iowa, and Rushville, Ind., will be retained. Officers of the Scott-Madden Iron Works Co. include W. F. Scott, president; Hudson Talbott, vice-president, and J. N. D. Dickinson, treasurer.

Changes in Myers Stone Co.

George S. Beimdiek, G. C. Kellog and Geo. W. Lawrence have purchased an interest in the Myers Stone Co. of Carthage, Mo., and Mr. Beimdiek will hereafter have active charge of its operations. The company owns 12 acres of stone land and quarries a grade of marble which is said to be of excellent quality. It operates a three-gang mill, two channelers, two quarry derricks, traveling crane, etc., and has furnished stone for many prominent buildings, including the Vernon county courthouse at Nevada, Mo.; U. S. postoffice at Joplin, Mo.; Carnegie Library, Joplin, Mo.; Carnegie Library, Carthage, Mo.; Benton County State Bank, Bentonville, Ark.; Severy State Bank, Severy, Kans., and others. Improvements will be made in the company's equipment and stripping will be done so that a large supply of mill blocks will always be on hand. Officers of the company are George W. Lawrence, president; G. C. Kellog, vice-president, and George S. Beimdiek, secretary-treasurer and general manager.

The Edwards Second Annual Banquet

An event that will live in the memory of those present was the second annual banquet tendered the foreign and traveling representatives and heads of departments by E. W. Edwards, president of the Edwards Manufacturing Co., "The Sheet-Metal Folks," Cincinnati, Ohio, on Thursday evening December 30. Mr. Edwards leaves the latter part of January for a six-months' trip around the world, visiting the principal cities in which the company has local representatives. Those at the banquet included E. W. Edwards, H. W. Edwards, G. R. Edwards, W. A. Edwards, G. D. Myers, J. M. Reynolds, O. S. Larkby, W. E. Larkby, G. P. Doll, H. W. Woodward, N. D. Jones, T. Reed Chunn, O. F. Kline, Louis R. Hildreth, A. E. Watson, L. A. Hildreth, A. J. Pearce, Chas. Spornhauer, A. T. Spornhauer, Lawrence Dieckelman, J. F. Agnew, H. E. Moomaw, W. H. Daycock, Jr., Jas. Kinsella, Sr., Frank Wilfert, Chas. Zeh, Wm. J. Richardson, Jos. Wilkins, James Robinson, T. McCabe, Jas. E. Tracey and B. A. Trimpe.

The Dodge Selling Agents Meet.

Every year just before Christmas members of the Dodge selling family meet at the home office of the Dodge Manufacturing Co., Mishawaka, Ind., to review the year's efforts and results, inspect the plant, discuss plans for the new year and make notes for use during the next 12 months. The 1909 conference was held on December 17, 18 and 19, the different branch offices of the company being represented by their respective managers. Among the addresses made was one by D. J. Campbell of the sales-promotion and advertising department which referred to the Dodge campaign. Mr. Campbell stated that it cost the company $50,000, divided among popular magazines, for space ranging from double pages to a few inches, but that the company regarded the expenditure as an investment in good-will and prestige, and cited many large companies as adopting the Dodge line as their shop standard. Among the companies using Dodge equipment are the Buick Motor Co., which is installing a complete line in its Michigan plant, the installation at present consisting of 4000 standard split-iron pulleys, over 2000 hangers and several miles of shafting with flange couplings; the Cleveland Worsted Mills, Raveno, O.; Kellogg Toasted Corn Flakes Co., and others.

TRADE LITERATURE.

Handshakes.

Handshakes, No. 14, a publication issued periodically by the Genuine Bangor Slate Co., Record Building, Easton, Pa., is now being distributed. This company desires to co-operate with prospective customers and will supply them with these pamphlets for distribution.

Cotton Chats.

Cotton Chats, No. 85, for November has been issued by the Draper Company, Hopedale, Mass. Among other data this folder illustrates eight patterns of Northrop filling bobbins, either type of which can be furnished in any one of the regular standard lengths, namely, six and three-fourths inches, seven and three-eighths inches, eight inches or eight and three-fourths inches.

Tungsten 250 Watt Multiple Lamp.

Bulletin 6-F, supplementing Bulletin 6-D, issued by the engineering department of the National Electric Lamp Association, 4411 Hough Ave., Cleveland, Ohio, is now being circulated. This publication illustrates and describes the Tungsten 250-watt multiple lamp, referring to the new method of rating tungsten lamps, regulation, cost of operation, etc.

The Protection of Iron and Steel.

The causes of corrosion of iron and steel are well known, and ways and means of avoiding this trouble in construction should forcibly appeal to contractors and others interested in the subject. In offering for consideration two of its products for the preservation of iron and steel construction the Glidden Varnish Co., Cleveland, Ohio, calls attention to Glidden's acid-proof coating and graphite acid-proof coating. These products are claimed to meet the expansion and contraction of iron and steel under the varying conditions of temperature, because of their extreme elasticity, and, without considering the cost per gallon, are said to be cheaper in the end than cheaper preparations. A pamphlet containing descriptive and illustra-

tive data regarding these products is being circulated by the company.

New Closet Seats and Tanks.

All sorts of schemes have been tried by manufacturers of closet seats and tanks to make them hold together. The sections of some wooden seats have been fastened together with bolts; others have been held together by running a hoop around the outside, etc. No way has, however, been found of treating wood so that dampness, moisture and heat would not affect it. In spite of anything that can be done it will shrink, swell, warp and crack. Then, of course, wood is porous, which is about as undesirable in closet seats, from a sanitary standpoint, as cracks and crevices. About all of the objectionable features of wooden seats and tanks seem to have been overcome in such an easy way in the line recently placed on the market by the H. W. Johns-Manville Company, New York, called "Sanitor," that it is strange no one has thought of this before. These seats and tanks are molded in one piece from indurated fiber. This material is familiar to most of us in connection with fiber pails, washtubs, water-cooler tanks, etc., many of which have given satisfactory service for 30 years or more. This material is non-porous and cannot absorb water; therefore no lining is required in tanks made of it, which does away with the danger of corrosion. It is claimed that this material will not swell, shrink, warp, crack or sweat. By a clever mechanical process the exact grain of mahogany and oak is transferred to these seats and tanks. This is done so perfectly that few would be able to distinguish them from wood. The manufacturers are sending a sample of this material and descriptive booklet to interested parties.

"PICKET LINE" RAILROAD.

Plans for a Route from Laredo to Samfordyce, Tex., on the Rio Grande.

C. M. Fish of Laredo, Tex., and J. C. Reister are reported working on a plan for a new railroad, nicknamed the Picket Line, to run from Laredo to Samfordyce, Tex., about 135 miles, via Rio Grande City. A report from San Antonio quotes Mr. Fish as saying that they have been working recently to secure the remainder of right of way desired, and preparations are being made for a preliminary survey. The route will be down the Rio Grande Valley and will follow the river as nearly as practical, opening for settlement considerable new land and providing transportation facilities for coal and other minerals, which are said to exist in the territory through which the road will run. St. Louis capital is said to be behind the plan, although the financiers are not concerned in the Yoakum railroads as was reported. It is hoped to begin work not later than February 1, and about twelve months will be required to complete it.

This proposed line would connect at Samfordyce with a branch of the St. Louis, Brownsville & Mexico Railway and make practically a continuous line from Laredo to Brownsville, Tex. Mr. Fish, who is actively promoting it, is general freight and passenger agent of the Texas-Mexican Railway, a standard-gauge line, 160 miles long, which runs from Laredo to Corpus Christi, Tex., and which is part of the National Railways of Mexico system.

It is expected that settlers will flock into the country through which the new road is to run as soon as it is put into operation.

American Engineers.

Meetings of the American Society of Mechanical Engineers will be held in New York on January 11, in St. Louis on January 15 and in Boston on January 21. The spring meeting of the society will be held this year as usual, in addition to the London meeting, which occurs in July. Atlantic City has been selected as the place for the spring meeting, and it will be held from May 31 to June 3, inclusive.

The January meeting in Boston will take the form of a banquet at the Hotel Somerset, to be tendered jointly by the American Society of Mechanical Engineers, the Boston Society of Civil Engineers and the Boston branch of the American Institute of Electrical Engineers, to the presidents of the there societies, George Westinghouse, Geo. B. Francis and L. B. Stillwell, respectively, and other guests, including John Anderson Bensel, the incoming president of the American Society of Civil Engineers.

The New York monthly meeting of the American Society of Mechanical Engineers will be held in the Engineer Societies' Building on Tuesday evening, January 11. The subject for discussion is lubrication. The paper upon efficiency tests of lubricating oils by Prof. F. H. Sibley of the University of Alabama will be presented, and important contributions upon the properties of lubricants, their efficiency, durability, characteristics, etc., will be made by Dr. C. F. Mabery of Case School, Cleveland, and Gen. Charles Miller of Franklin, Pa.

Norway's Iron Deposits.

Consul Felix S. S. Johnson of Bergen furnishes the following information concerning the iron-ore deposits of Norway:

In a recent lecture Professor Vogt stated that Norway was only commencing to develop its vast mineral wealth. The richest iron mines were located in the northern part of the country, as well as in the Trondhjemske. It has been calculated that the mines at Sydvarager contain 100,000,000 tons, and that the yearly production will be 600,000 tons. Operations on these mines will probably commence next summer.

The work at the Dunderlandsdalen mines has been stopped for some time, but it will be resumed in the near future, when the Swedish method of treating the ore will be employed, with the hope that the works will produce 1,000,000 tons a year.

It is estimated that the mines in the Tromso district contain about 30,000,000 tons of ore. Machinery has lately been installed in these mines. The yield will be about 200,000 tons per annum. Several other mines in the north indicate abundance of iron ore.

Old methods of treating iron ore are at present employed in the mines in the north of Norway. These plants cost about $2,600,000. Professor Vogt again asserted that electric treatment of ores ought to be employed, for the reason that a large investment was not needed for the construction of an electrical plant.

Lynchburg.

"Cold Facts Which Read Like a Fairy Story" is the title of a handy booklet issued by the Chamber of Commerce of Lynchburg, Va., Mr. E. H. Mayfield, business secretary, as a part of the material which the Chamber of Commerce will circulate widely in advertisement of the many opportunities in the city for the establishment there of successful industries. It tells of the notable facts that have already been achieved in industry, and of the advantages for even a greater diversity of manufactures than that which has already given Lynchburg its high standing. These facts are presented in attractive but condensed form, and the Chamber of Commerce is prepared to elaborate details for the benefit of anyone seeking a location there.

Fireproof Suburb.

Plans are being formulated at Washington for the establishment of a fireproof suburb, said to be unique in this kind of enterprise. They are in charge of Milton Dana Morrill, architect, 405 Corcoran Building, Washington, D. C. He and associates have organized the Virginia Highlands Association, capitalized at $100,000, and purchased 100 acres of land at Arlington, Va. This company will construct streets, sidewalks, etc., and erect a number of fireproof dwellings of the one, four, five and six-room type (with flat roofs for gardens), of brick and concrete construction, standard steel molds being used.

Birmingham Iron Market.

[Special Dispatch to Manufacturers' Record.]

Birmingham, Ala., January 3.

Conditions have been rather quiet in iron circles the past week, mostly on account of the holidays. Some business was booked for prompt and first quarter delivery at $14 at the furnace. Two of the largest producers are out of the market for the present. Stocks on yards are not increasing, but, on the other hand, January will show a decided curtailment in output. This, together with general good feeling, is believed to be a good omen of reasonably prompt reaction and establish satisfactory market. Fourteen dollars and fifty cents is asked for second quarter and first half delivery.

There has been brisk trading in the heavy pipe market, and manufacturers report some good tonnage sold, particularly in the Middle West.

The old material market is in direct sympathy with pig-iron situation.

Coal and coke are active at high levels.

Iron Ore in Mississippi.

A dispatch from Enterprise, Miss., says:

"Analyses have been made of the iron-ore vein found here by Dr. J. H. Stubbins, Arthur J. Kesler and Dr. E. T. Cox. The first two are mineralogists of England and the latter is late State geologist of Indiana. Their analyses show the ore to make an average of 46 per cent. of iron ore to the ton. Three tons of the ore, thrown into open furnace, not assorted, will make one ton of pig-iron. Special mention is made of the natural conditions, as the vein is only covered at a depth of two to ten feet of dirt, that can be easily and rapidly removed with a steam shovel. The ore is soft until exposed to the air, and can be removed in the same manner. The vein is 33 feet, of superior quality, and can be manufactured into a high grade of Bessemer steel. While the vein is classed as lean ore, the quality and natural conditions, as reported by the English scientists, are far better than the famous mines of Cleveland, England."

Texarkana Investments.

Mr. V. E. Buron, secretary of the Board of Trade of Texarkana, Ark., estimates that the capital invested in new enterprises in that city in 1909 aggregates $600,000.

The South American Fruit & Steamship Co., organized at Baltimore with $300,000 capital, will, it is stated, put on a line of steamers between Norfolk, Va., and the Islands of Jamaica and Cuba. The company has chartered four steamers for the business. The officers are: Martin H. K. Paulsen, president; J. B Timmerman, secretary; the other directors being James G. Pugh, Vincent Demarco, Bayard N. Cole, Robert V. Matthews, Charles S. Skinner, Daniel K. Valentine, Bruce K. Conover, Edmund R. Bellman, W. W. Aube and J. H. Cardon.

It is reported at New Orleans that Dr. W. J. Brown of Detroit, Mich., and D. V. R. Manley of Toledo are planning the purchase of 100,000 acres of land near Lockport, La., which is to be reclaimed and converted into sugar plantations.

FINANCIAL NEWS

The MANUFACTURERS' RECORD invites information about Southern financial matters, items of news about new institutions, dividends declared, securities to be issued, openings for new banks, and general discussions of financial subjects bearing upon Southern matters.

Review of the Baltimore Market.

Office MANUFACTURERS' RECORD,
Baltimore, Md., January 4.

Considerable activity prevailed in the Baltimore stock market during the past week, notwithstanding the holidays. In the trading United Railways common sold at 14¼; do. trust certificates, 14¼ to 14; do. incomes, 60¼ to 60¾, reacting to 59⅞, with last sale at 60⅜; do. funding 5s, 84 to 84½; do. do. scrip, 84 to 84½; United 4s, 86¾ to 87; Consolidated Gas, Electric Light & Power common, 46½ to 49; do. preferred, 87 to 88; do. 4½s, 85¼ to 85¾; Consolidated Gas 6s, 100¼; do. 5s, 110⅛; Seaboard Air Line common, 23½ to 24½; Seaboard Company common, 27½ to 27; do. first preferred, 80½; do. second preferred, 47 to 46¾; Seaboard 4s, 86; do. stamped, 84½ to 85⅛; Seaboard three-year 5s, 99; do. 10-year 5s, 99½ to 99⅜; Consolidated Cotton Duck, 6¾ to 7¼; do. preferred, 21 to 25; Mt. Vernon-Woodberry Cotton Duck 5s, 76½ to 77½, last sale at 77.

Citizens' Bank sold at 39 to 39½; Merchants' Bank, 175; Bank of Commerce, 30¾; American Bonding, 80 to 81; Baltimore Trust, 305 to 310, and ex-dividend, 297 to 300; Maryland Trust preferred, 106; Continental Trust, 225; Fidelity & Deposit, 153 to 155; Fidelity Trust, 223½; United States Fidelity, 140; Maryland Trust common, 81 to 85.

Other securities were dealt in thus: Atlantic Coast Line of Connecticut, 350; Erie Railroad, 34; Northern Central, 116 to 118½, last sale at 117¼; Pennsylvania Railroad, 137⅛; Consolidation Coal, 116; Houston Oil common, 8⅜ to 8⅝; do. preferred, 40½ to 41; Anacostia & Potomac 5s, 102¾ to 103; do. guaranteed, 105; Atlantic Coast Line new 4s, certificates, 103¾ to 104; do. (Louisvile & Nashville) collateral trust 4s, 94⅞; Atlantic Coast Line Consolidated 4s, 95 to 96½; do. of South Carolina 4s, 98; do. convertible debenture 4s, 103⅞; do. Connecticut 5-20s, 93; Maryland Electric 5s, 97¼; Virginia Midland 5th, 106½; Baltimore Traction 5s, 111; Baltimore City Passenger 5s, 100⅜; do. 4½s, 98¾; Norfolk & Portsmouth Traction 5s, 83 to 83½; Norfolk Street Railway 5s, 109; Nashville Water 4½s, 1920, 101½; Consolidation Coal refunding 4½s, 94⅞; Alabama Midland 5s, 108; Norfolk & Portsmouth Traction common, 20⅛ to 21; Fairmont & Clarksburg Traction preferred 77; Georgia Southern & Florida second preferred, 76; Georgia Southern & Florida 5s, 109½; Macon, Dublin & Savannah 5s, 97; Georgia Southern & Florida common, 30; Fairmont & Clarksburg Traction 5s, 96¾ to 96½; Georgia, Carolina & Northern 5s, 105¼; Maryland & Pennsylvania incomes, 65; Fairmont Coal 1st 5s, 96½; George's Creek Coal & Iron, 120; Baltimore Traction (North Baltimore Division) 5s, 113; Baltimore & Harrisburg Western extension 5s, 106¼; Baltimore & Potomac main line 6s, 101½; Memphis Street Railway 5s, 99¾; Richmond, Fredericksburg & Potomac 4½s, 106; Georgia & Florida preferred, 20; Alabama Consolidated Coal & Iron preferred, 60; Merchants & Miners' Transportation Co., voting trust, 90; Norfolk Railway & Light 5s, 90½.

SECURITIES AT BALTIMORE.

Last Quotations for the Week Ended January 4, 1910.

Railroad Stocks.	Par.	Bid.	Asked.
Atlantic Coast of Conn.	100	350	352½
Georgia Southern & Florida	100	...	40
Georgia South. & Fla 1st Pfd.	100	96	97
Georgia South. & Fla. 2d Pfd.	100	75	...
Maryland & Penna.	100	16	28
Norfolk Railway & Light	25	21	24
Seaboard Co. Com.	100	27	27½

[For Additional Financial News, See Pages 172 and 174.]

☞ Send for our January List of

SOUTHERN MILL STOCKS and BONDS

F. C. ABBOTT CO., Charlotte, N. C.

Established 1835.

The Merchants National Bank

South and Water Sts., BALTIMORE, MD.

DOUGLAS H. THOMAS, President.
WM. INGLE, Vice-Prest. and Cashier.
J. C. WANDS, Asst. Cashier.
JOHN B. H. DUNN, Asst. Cashier

Capital, $1,500,000
Surplus and Profits, - - - $900,000
Deposits $12,000,000

Accounts of Banks, Bankers, Corporations and Individuals solicited. We invite correspondence.

JOHN NUVEEN & CO.

1st Nat. Bank Bldg., CHICAGO

We purchase SCHOOL, COUNTY and MUNICIPAL BONDS. Southern Municipal Bonds a Specialty.

Write us if you have bonds for sale.

THE FIRST NATIONAL BANK

OF KEY WEST, FLA.

United States Depository and Disbursing Agent.

Capital, - - - - - - $100,000
Surplus and Undivided Profits - 40,000

A general banking business transacted. Special attention given to collections.

DELAWARE TRUST CO.

WILMINGTON, DEL.

EDWARD T. CANBY, President.
J. ERNEST SMITH, General Counsel and Vice-President.
HARRY W. DAVIS, Secretary.

Fully Equipped Department for the Organization of Corporations under advice of Counsel, and for the Registration of Corporations as required by the Delaware Law.

Represents over 500 Domestic and Foreign Corporations.

The Delaware Corporation Law is Broad, Liberal, Safe and Stable. Granting and annual taxes low.

Hugh MacRae & Co.

BANKERS

MISCELLANEOUS SOUTHERN SECURITIES

COTTON MILL STOCKS

WILMINGTON, N. C.

NEW YORK CITY 149 Broadway

Southern Steam Railroad Securities

DEALT IN

F. J. LISMAN & CO.

Specialists in Steam R. R. Securities

Members New York Stock Exchange,

30 Broad Street NEW YORK

404 Connecticut Mutual Bldg., Hartford.
Land Title & Trust Bldg., Philadelphia.

CROSS CREEK COAL COMPANY 6% Gold bonds, total issue $250,000. All have been disposed of to investors and bankers in different parts of the country, including Saco, Maine; Boston, Mass.; Rochester, N. Y.; Westfield, Olean, Fredonia and Buffalo, N. Y.; Franklin, Coudersport, Pittsburgh, Smethport, Shamokin and Port Allegany, Pa.; Columbus, Dayton and Springfield, Ohio; Northfork, Welch and Bluefield, W. Va.; Roanoke, Va.; Nashville, Knoxville, Jasper, Chattanooga and South Pittsburg, Tenn.; Atlanta, Ga.; Lowell, Mass.; East Orange, N. J., and Washington, D. C., until now there are but $30,000 of them left. These bonds are first lien on 7000 acres of the best coal properties in Tennessee, and $75,000 of this money is being spent on an up-to-date coal works with a capacity of about 1000 tons a day. Particulars will be furnished from the office, 1006 Mutual Life Building, Buffalo, N. Y. P. S.—A bonus of preferred stock will be given with the bonds.

GEO. M. CLARK

Auditor and Public Accountant

Room 315 James Building

CHATTANOOGA, TENN.

INVESTMENT SECURITIES

Southern Stocks and Bonds
Municipal and Corporation
Cotton Mill Stock a Specialty

WM. S. GLENN - Broker - SPARTANBURG, S. C.

"AMERICAN"

STRENGTH *in* ROPE *is* QUALITY

Recent government tests show "AMERICAN" PURE MANILA ROPE to be from 10% to 25% stronger than the standards set by the United States Government for manila ropes of various sizes.

AMERICAN" ROPE is most economical because it gives the longest service and the greatest value for the money invested.

Specify "AMERICAN" on your orders and turn rope expense into rope economy.

WRITE for our booklet "ROPE" with samples and prices.

THE AMERICAN MFG. CO.

MANILA - - SISAL - - JUTE CORDAGE

65 WALL STREET NEW YORK, N. Y.

TRANSMISSION ROPE

INTERNATIONAL TRUST CO.

OF MARYLAND

MAKES A SPECIALTY OF SOUTHERN BUSINESS

OUR BOARD OF DIRECTORS

Leading business men in Cotton, Iron, Railroad, Finance, Tobacco, Paper, Lumber, Copper, Dry Goods, Law, etc., constitute our twenty-four Directors—names that insure close supervision and safe leadership.

GEO. W. WATTS	Capitalist and Director American Tobacco Co.	Durham, N. C.
C. SIDNEY SHEPARD	Capitalist and Director Western Union Telegraph Co.	New York.
STEVENSON A. WILLIAMS	President Harford National Bank	Bel Air, Md.
LLOYD LOWNDES	Vice-President Second National Bank	Cumberland, Md
SUMMERFIELD BALDWIN	Woodward, Baldwin & Co., Cotton Goods, and Vice-President National Exchange Bank (Baltimore)	Baltimore.
WM. C. SEDDON	Wm. C. Seddon & Co., Bankers and Brokers	Baltimore.
CHAS. K. OLIVER	President Consolidated Cotton Duck Co.	Baltimore.
RICHARD H. EDMONDS	President Manufacturers' Record Pub. Co.	Baltimore.
ISAAC H. DIXON	Smith, Dixon Co., Wholesale Paper Dealers	Baltimore.
J. WM. MIDDENDORF	Middendorf, Williams & Co., Bankers and Brokers	Baltimore.
DAVID HUTZLER	Hutzler Brothers, Dry Goods	Baltimore.
JOS. CLENDENIN	Secretary Baltimore Copper Smelting & Rolling Co.	Baltimore.
TOWNSEND SCOTT	Townsend Scott & Son, Bankers and Brokers	Baltimore.
B. HOWARD HAMAN	Gans & Haman, Attorneys-at-Law	Baltimore.
DR COUROY W. THOM	President Maryland Portland Cement Co.	Baltimore.
EDWARD N. RICH	Attorney-at-Law	Baltimore.
CHAS. T. WESTCOTT	Attorney-at-Law	Baltimore.
DOUGLAS H. GORDON	President	Baltimore.
SAMUEL C. ROWLAND	Vice-President	Baltimore.
LORING A. COVER	Sec'y and Treas. Maryland Portland Cement Co.	Baltimore.
CHARLES D. FENHAGEN	Secretary-Treasurer	Baltimore.
CHARLES H. GRASTY	Editor St Paul Dispatch	St. Paul, Minn
J. SAWYER WILSON, Jr.	J. S. Wilson, Jr., & Co., Bankers	Baltimore.
JOHN T. HILL	R. C. Hoffman & Co.	Baltimore.

OFFICERS

DOUGLAS H. GORDON, President. SAMUEL C. ROWLAND, Vice-President.
SUMMERFIELD BALDWIN, Vice-President. CHAS. D. FENHAGEN, Sec'y and Treas.
WALTER D. FOCKE, Assistant Secretary and Assistant Treasurer.

Incorporated Under Special Act of Legislature

BALTIMORE AUDIT COMPANY

1027-1029 Calvert Bldg., BALTIMORE, MD.

All work executed by or under direct supervision of Certified Public Accountants.

THE AMERICAN AUDIT CO.

E. A. LEITCH, Resident Manager. Mutual Building, RICHMOND, VA.

Our reports are accepted by the leading financiers of the world, and are frequently made the basis of credit.

Home Office, 100 Broadway, New York Branches in all Principal Cities

---

Bank of Richmond

Capital and Surplus, $1,500,000

RICHMOND, VA.

JOHN SKELTON WILLIAMS, President.
FRED'K E. NOLTING, 1st Vice-President.
T. K. SANDS, 2d Vice-President and Cashier.
H. A. WILLIAMS, Assistant Cashier.
L. D. CRENSHAW, JR., Trust Officer.

In aiding the development of legitimate business enterprises, this bank believes that it performs a required duty, and to this end offers the services of a live, progressive bank, conservatively managed.

The National Exchange Bank

OF BALTIMORE, MD.

Hopkins Place, German and Liberty Sts.

Capital, $1,000,000

July 15, 1903, Surplus and Profits, $671,631.60

OFFICERS:

WALDO NEWCOMER, President.
SUMMERFIELD BALDWIN, Vice-Pres.
R. VINTON LANSDALE, Cashier.
WM. J. DELCHER, Asst. Cashier.
C. G. MORGAN, Asst. Cashier.

Accounts of Mercantile Firms, Corporations, Banks, Bankers and Individuals Invited.

Wm. F. Bockmiller, Prest. John G. Hullett, Sec.

Baltimore Office Supply Co.

106 S. Eutaw St., Baltimore, Md.

MANUFACTURERS OF

Stamps, Stencils, Seals, Metal Signs, etc. Office and Bank Supplies.

Write for prices.

Our Bond Department

is prepared to furnish desirable Corporation, Timber, Irrigation and Municipal Bonds which yield substantial rates of interest.

Write for particulars.

Interstate Trust & Banking Co.

NEW ORLEANS, LOUISIANA

Capital and Surplus over One Million Dollars

The Delaware Fidelity Trust Co.

Home Office—Dover, Delaware

Is especially interested in the development of the South and will assist substantial enterprises requiring additional capital.

Announces the opening of a branch office in the city of Philadelphia, where arrangements may be made for the organization and consolidation of corporations, registration of stock, and for acting as trustee in bond issues.

Correspondence solicited.

THE DELAWARE FIDELITY TRUST CO.

1415 Arch Street, Philadelphia, Pa.

MANUFACTURERS and JOBBERS

Frequently find it necessary to have BANKING FACILITIES in addition to those offered by local banks.

FIRST NATIONAL BANK OF RICHMOND, VA.

With assets of nine million dollars, offers just the additional facilities required.

Jno. B. Purcell, President.
Jno. M. Miller, Jr., Vice-Pres. and Cashier.

GO SOUTH!

Business Opportunities, Investment Securities, Real Estate, Timber, Mines, Industrial Properties and Mortgages in Southern States and Mexico, correspond with

SOUTHERN STATES DEVELOPMENT CO.

GEO. B. EDWARDS, President, New York, N. Y. Office, Tribune Building, 154 Nassau St. Connections in the Principal Cities of Europe

---

Bank Fixtures

We are manufacturers of showcases, store equipment and commercial furniture. *Quality specialists.* Get our prices before purchasing. Catalog free.

QUINCY SHOWCASE WORKS, Quincy, Ill.

SURETY BONDS

Fidelity & Deposit Co.

OF MARYLAND

Home Office, BALTIMORE, MD.

Assets Over $5,000,000

Pioneer Surety Co. of the South. Becomes Surety on bonds of every description.

AGENTS IN ALL PRINCIPAL CITIES

HARRY NICODEMUS, Sec'y and Treas. EDWIN WARFIELD, President

Seaboard Co. 1st Pfd.	100	...	80½
Seaboard Co. 2d Pfd.	100	46½	47¼
United Railways & Electric Co.	50	14	14¼
Bank Stocks.			
Citizens' National Bank	10	39	...
First National Bank	100	...	137
Merchants' National Bank	100	172	179
National Bank of Commerce	15	30½	31¼
National Exchange Bank	100	...	158
National Howard Bank	10	13½	...
National Marine Bank	30	40	...
National Mechanics' Bank	10	...	29
National Union Bank of Md.	100	122	125
Third National Bank	100	120	...
Trust, Fidelity and Casualty Stocks.			
American Bonding Co.	25	80	81
Balto. Trust & Guar.	100	290	...
Continental Trust	100	224	225
Fidelity & Deposit	50	154	155
Fidelity Trust	100	220	224
Maryland Trust	100	81	90
Maryland Trust Pfd.	100	...	106
Merc. Trust & Dep.	50	145	152
U. S. Fidelity & Guaranty	100	140	...
Miscellaneous Stocks.			
Ala. Con. Coal & Iron	100	25	35
Ala. Con. Coal & Iron Pfd.	100	50	65
Con. Cotton Duck Com.	50	7	7¼
Con. Cotton Duck Pfd.	50	24¾	25
Con. Gas, Elec. Lt. & P. Com.	100	48¾	50
Con. Gas, Elec. Lt. & P. Pfd.	100	87	89
Consolidation Coal	100	115	116
George's Creek Coal	100	121	122½
Mer. & Miners' Trans Co.	100	...	90
Railroad Bonds.			
Atlanta & Charlotte Ext. 4½s		99⅞	...
Atlantic Coast Line 1st 4s, 1952		95½	96
Atlantic Coast Line New 4s, Ctfs.		103½	104
Atlantic C. L. Com. 4s, Ctfs., 5-20s.		92½	93¼
Atlantic C. L. (Conn.) 5s, Ctfs.		105	...
Atlantic C. L. (Conn.) 4s, Ctfs.		87	...
Atlantic C. L. (S. C.) 4s, 1948		97½	98½
Balto. & Harrisburg 5s, 1936		107	...
Balto. & Harrisburg Ext. 5s, 1933		105½	106½
Carolina Central 4s, 1949		...	92½
Charleston & West. Car. 5s, 1946		106½	107
Coal & Coke Railway 5s		95	...
Coal & Iron Railway 5s, 1920		102¼	102½
Col. & Green. 1st 6s, 1916		106	109
Georgia & Alabama 5s, 1943		105	106½
Georgia, Car. & North. 1st 5s, 1929		105¼	105½
Georgia Pacific 1st 6s, 1922		113¾	...
Georgia South. & Fla. 1st 5s, 1945		108	109½
Macon, Dublin & Savannah 5s		97	...
Petersburg Class A 5s, 1926		...	112
Potomac Valley 1st 5s, 1941		108	110
Raleigh & Augusta 1st 6s, 1926		116	118¼
Seaboard Air Line 4s, 1950		85¾	...
Seaboard Air Line 5s, 10-year, 1911		99⅜	99½
Seaboard Air Line 5s, 3-year		99	99¼
South Bound 5s, 1941		106	...
Virginia Midland 2d 6s, 1911		100½	102
Virginia Midland 5th 5s, 1926		106½	...
Western Maryland 4s, 1952		86	87
Western Maryland 2d 4s		72½	73
Western N. C. Con. 6s, 1914		106	106¾
W. Va. Cent. 1st 6s, 1911		101	101½
Street Railway Bonds.			
Anacostia & Potomac 5s, 1949		102½	103
Atlanta Con. St. Ry. 5s		105	106½
Augusta Ry. & Elec. 5s, 1940		102	...
Balto. City Pass. 5s, 1911		100¼	100¾
Balto. City Pass. 4½s		98½	99½
Balto. Trac. (N. B. Div.) 5s, 1942		112¾	113
Charleston Con. Elec. 5s, 1999		90½	93
City & Suburban 5s (Balto.), 1922		106	108
City & Suburban 5s (Wash.), 1948		103½	105
Knoxville Traction 1st 5s, 1928		104½	...
Lexington Railway 1st 5s, 1949		90	95
Macon Ry. & Lt. 1st Con. 5s, 1953		95¾	...
Maryland Electric Railways 5s		97¼	...
Memphis Street Railway 5s		99¾	100
Newport News & Old Pt. 5s, 1938		93	...
Norfolk & Ports. Traction 5s		83⅞	84
Norfolk Railway & Light 5s		98⅛	...
Norfolk Street Railway 5s, 1944		106½	...
Richmond Traction 5s		105	...
United Railways 1st 4s, 1949		86⅞	87
United Railways Income 4s, 1949		60	60¼
United Railways Funding 5s		84	84½
Miscellaneous Bonds.			
Baltimore Electric 5s		90½	91
Consolidated Gas 6s, 1910		100¼	100½
Consolidated Gas 5s, 1939		110	110¼
Consolidated Gas 4½s		95⅝	96
Con. Gas, Elec. Lt. & P. 4½s		85⅝	86
G.-B.-S. Brewing 1st 4s		42½	...
G.-B.-S. Brewing Income 4s		...	12
Maryland Steel Co. 5s		102	103
Mt. Vernon-Woodb'y Cot. Duck 5s.		77	78

SOUTHERN COTTON-MILL STOCKS.

Quotations Furnished by William S. Glenn, Broker, Spartanburg, S. C., for Week Ending January 3.

	Bid.	Asked.
Abbeville Cotton Mills (S. C.)	...	75
Aiken Mfg. Co. (S. C.)	...	85
American Spinning Co. (S. C.)	160	...
Arcadia Mills (S. C.)	95	...
Arkwright Cotton Mills (S. C.)	100	105
Augusta Factory (Ga.)	65	70
Avondale Mills (Ala.)	116	...
Belton Mills (S. C.)	120	...
Brogon Mills (S. C.)	30	37
Cannon Mfg. Co. (N. C.)	135	...
Cabarrus Cotton Mills (N. C.)	130	135
Chiquola Mfg. Co. (S. C.)	160	164
Clifton Mfg. Co. (S. C.)	105	110
Clinton Cotton Mills (S. C.)	120	125
Columbus Mfg. Co. (Ga.)	93	98
Courtney Mfg. Co. (S. C.)	...	95
Dallas Mfg. Co. (Ala.)	99	...
Darlington Mfg. Co. (S. C.)	76	88
D. E. Converse Co. (S. C.)	100	105
Drayton Mills (S. C.)	95	100
Eagle & Phenix Mills (Ga.)	117	...
Easley Cotton Mills (S. C.)	162	170
Enoree Mfg. Co. (S. C.)	52	60
Enoree Mfg. Co. (S. C.) Pfd.	90	100
Enterprise Mfg. Co. (Ga.)	75	...
Exposition Cotton Mills (Ga.)	195	200
Gainesville Cotton Mills (Ga.)	68	70
Glenwood Cotton Mills (S. C.)	...	145
Gluck Mills (S. C.)	92	95
Graniteville Mfg. Co. (S. C.)	158	165
Grendel Mills (S. C.)	110	113
Hartsville Cotton Mill (S. C.)	150	...
Henrietta Mills (N. C.)	150	165
Inman Mills (S. C.)	105	108
Lancaster Cotton Mills (S. C.)	125	135
Lancaster Cot. Mills (S. C.) Pfd.	97	...
Laurens Mills (S. C.)	129	...
Limestone Mills (S. C.)	150	156
Lockhart Mills (S. C.)	80	...
Lockhart Mills (S. C.) Pfd.	98	...
Loray Cotton Mills (N. C.) Pfd.	92	96
Marlboro Cotton Mills (S. C.)	83	...
Mills Mfg. Co. (S. C.)	92	98
Mollohon Mfg. Co. (S. C.)	105	...
Monaghan Mills (S. C.)	128	135
Monarch Cotton Mills (S. C.)	104	110
Newberry Cotton Mills (S. C.)	124	130
Ninety-Six Cotton Mills (S. C.)	135	145
Norris Cotton Mills (S. C.)	124	130
Orr Cotton Mills (S. C.)	104	106
Pacolet Mfg. Co. (S. C.)	98	100
Pelzer Mfg. Co. (S. C.)	...	155
Piedmont Mfg. Co. (S. C.)	175	...
Poe Mfg. Co., F. W. (S. C.)	165	170
Saxon Mills (S. C.)	125	...
Sibley Mfg. Co. (Ga.)	60	65
Spartan Mills (S. C.)	129	...
Tucapau Mills (S. C.)	250	...
Union-Buffalo (S. C.) 1st Pfd.	77	80
Union-Buffalo (S. C.) 2d Pfd.	20	25
Victor Mfg. Co. (S. C.)	144	148
Warren Mfg. Co. (S. C.)	92	93
Warren Mfg. Co. (S. C.) Pfd.	...	106
Washington Mills (Va.)	20	...
Whitney Mfg. Co. (S. C.)	120	...
Wiscassett Mills (N. C.)	135	...
Woodruff Cotton Mills (S. C.)	145	152
Woodside Cotton Mills (S. C.)	94	...
Watts Mills (S. C.)	84	90
Williamston Mills (S. C.)	119	125

Baltimore Trust Co.

The success of the Baltimore Trust & Guarantee Co. is reflected in its declaration of an extra dividend of 2 per cent. on the business of the half-year ending December 31, the regular dividend for the period being 7 per cent., this making a total of 16 per cent. in dividends for the year 1909. At the recent directors' meeting President Thomas H. Bowles submitted figures showing that the earnings scored a considerable increase beyond the dividend, and that there was a substantial gain in the company's business since a year ago. Deposits, for instance, are 20 per cent. larger.

The Baltimore Trust is one of the prominent and prosperous financial institutions of Baltimore. It has been successful from its inception, and the fact that its stock has lately sold at more than three times the par value is evidence of the esteem in which it is held by investors and the general public.

FINANCIAL CORPORATIONS.

Ala., Dozier.—Approved: The First National Bank of Dozier; capital $25,000. Organizers, L. M. Bashinsky, A. J. Morrill, Fox Henderson, W. C. Black and R. Frost.

Ala., Gadsden.—Reported that J. B. Wadsworth of Birmingham contemplates organizing a bank at Gadsden.

Ala., Mobile.—Official.—The Safety Banking & Realty Co., 256 St. Michael St., incorporated; capital $50,000; directors, Henry N. Newsome, president; I. E. Evans, vice-president; James R. Knox, cashier; Albert Boyd, secretary, and W. J. Robinson, manager of realty department; Henry Knox and Fred Green.

Ala., Birmingham.—The Ore Accident & Health Insurance Co. has made application for a charter; capital $20,000. Incorporators: President, D. E. Manasco; vice-president, Hugh L. Allison; secretary, G. W. Carr; treasurer, E. F. Ensien; medical director, Dr. W. H. Bell; assistant surgeon, Dr. E. M. Prince; S. P. King, G. B. Crowe, C. J. McElroy, J. R. Pill, R. B. Watts.

Ark., Blytheville.—An official letter says that the Planters Bank & Trust Co., chartered with $50,000 capital, will, about January 1, succeed the Farmers' Bank; M. P. Carpenter, president; A. T. Cloar, vice-president; J. M. Vivion, cashier, and H. Brown, assistant cashier.

Ga., Jenkinsburg.—The Farmers' Bank of Jenkinsburg has been granted a charter; capital $30,000; incorporators, Dr. B. F. Akin, S. D. Thurston, W. B. Bowden, J. W. Benson, Jr., of Jenkinsburg, P. J. Evans and L. A. Adkinson of Jackson.

Ga., Macon.—Official: The Merchants and Mechanics' Savings Bank, capital $25,000, will begin business January 3 with W. T. Morgan president, W. A. Taylor vice-president, T. W. Hawkes cashier; directors, W. T. Morgan, W. A. Taylor, Emory Winship, A. P. Cain, John F. Lackey, E. W. Stetson and R. H. Smalling.

Ga., Savannah.—Reports state that the People's Bank of Savannah is being organized by Edward M. O'Brien, E. F. O'Connor and others. It is hoped to begin business about February 1.

Ga., Vienna.—Official: First National Bank of Vienna, capital $50,000, organized by T. H. Gregory, W. B. Nichols, J. H. Fokes, Unadilla, Ga.; A. E. Jordon, D. A. Taylor, M. E. Rushing, Ed Howell, M. E. Gummage, L. L. Woodard and others of Vienna, Ga.; J. T. Ormes of Atlanta, Ga.

Ga., Wrightsville.—Official: The Exchange Bank chartered; capital $25,000; U. R. Jenkins, president; J. M. Mason, vice-president; E. E. Daley, cashier; G. E. Fulford, assistant cashier; Judge A. F. Daly, attorney.

Ky., Louisville.—The Republic Indemnity Co. is reported organized with $100,000 capital and $25,000 surplus. Charles P. Wofford will be president, and among the directors are R. E. Hughes, president of the Kentucky Electric Co., and Fred Levy of Levy Bros.

Ky., West Liberty.—The Commercial Bank of West Liberty is reported to have filed articles of incorporation; capital $15,000. W. O. Greening and others are said to be interested.

Md., Baltimore.—The Maryland Motor Car Insurance Co. of Baltimore, capital $100,000, surplus $25,000, has organized with directors thus: John R. Bland, Charles E. Rieman, J. Purviance Bonsal, W. Irvine Keyser, Miles White, Jr., Jacob A. Ulman, James A. Richardson, Franklin P. Cator and William Whitridge.

Md., Baltimore.—A new fire insurance company, capitalized at $2,000,000 is being organized. The new concern will represent a consolidation of the Maryland Fire Insurance Co. of Easton and a number of small companies now doing business in Baltimore. W. L. Franz of Easton is engineering the deal.

Md., Clearspring.—A national bank capitalized at $25,000 is reported being organized with directors thus: Elwood McLaughlin, W. W. Seibert, D. S. Seibert, W. C. Corbett, Thomas Hassett, Newton E. Funkhouser, Henry Heiser, B. J. Boswel, W. F. Snyder, J. A. Seibert, George T. Prather, Abram Hege and Dr. J. P. Berry.

N. C., Elon College.—The Elon Banking & Trust Co. is reported to have been authorized to begin business; capital $10,000. W. T. Lawrence is cashier.

N. C., Reidsville.—The Rockingham Savings Bank & Trust Co. is reported chartered with $25,000 capital by W. M. Giles of Reidsville, A. L. Brooks of Greensboro and others.

N. C., Wadesboro.—The Wadesboro Building and Loan Association is reported organized with T. F. Jones, president; W. N. Jeans, vice-president, and J. W. Gulledge, secretary and treasurer.

Okla., Allen.—The First National Bank of Allen is authorized to begin business; capital $25,000. Charles E. Head is president, C. M. Means vice-president and W. M. Pegg cashier.

Okla., Heavener.—Official: The first National Bank is to succeed the Bank of Heavvener.

Okla., Kiefer.—Official: The Guarantee State Bank chartered; capital $10,000; J. W. Orr, president, and W. R. Ritchie, vice-president, both of Tulsa, Okla.; T. J. Sullivan, cashier, Kiefer; Tom Hagler of Tulsa and E. L. Orr of Vinita, directors.

Okla., Muskogee.—The New England Loan & Investment Co. incorporated with $10,000 capital; directors, F. C. Hubbard, Ezra Brainerd, Jr., and Ernest H. Hubbard.

Okla., Muskogee.—The American National Bank of Muskogee, capital $150,000, has been approved. The directors are Edgar John, George B. Frazier, Willard John, R. B. Beard, George A. Murphy and others.

Okla., Shawnee.—The Security State Bank is reported incorporated with $50,000 capital by C. D. Borer, B. B. Brundage, C. H. Eckford, J. C. Fisher and E. W. Hill, all of Shawnee, and A. R. Eastman of Guthrie.

S. C., Chester.—Official: The Planters' Bank chartered; capital $35,000. Directors: D. P. Crosby, president; J. L. Abell, vice-president; A. G. Thomton, cashier; John M. Wise, G. D. Heath, T. M. Whisonant and R. E. Sims.

S. C., Columbia.—The Industrial Trust Co. has been granted a commission to do a general investment business; capital $5000; petitioners, W. P. Cooper and C. W. Croomer.

S. C., Conway.—Official: The Conway Savings Bank chartered; capital $10,000. Directors, D. A. Spivey, president; Hal L. Buck, vice-president; B. G. Collins, J. A. McDermott, C. P. Quattlebaum, D. T. McNeill and John C. Spivey. W. Percy Hardwicke will be cashier. A press report says that it is a conversion of the Bank of Conway.

Tenn., Bethpage.—The Bank of Bethpage is reported being organized with $15,000 capital by John W. Whitside, W. G. Senter, S. L. Yates, F. M. Eads, O. C. Whitsides, E. B. Wilson and John L. Harris.

Tenn., Memphis.—The De Soto Investment Co. has made application for a charter; capital $50,000. Incorporators, Joseph S. Tobin, L. D. Smith, E. R. Turley, William M. Farrington, Jr., and C. M. Bryan.

Tex., Belton.—J. Z. Miller, Jr., writes that he is not interested in the new State bank being organized.

Tex., Eddy.—Official: The Farmers and Merchants' State Bank of Eddy, incorporated with $10,000 capital, will begin business January 1. Directors: W. R. Boyd, Jr., president; Dr. M. P. Smartt, vice-president; J. R. Laughlin, chairman; E. D. Legler, J. H. Nabors and A. F. Schofield, all of Eddy, and W. H. Staton of Moody, Tex. N. M. Cawthon is cashier.

Tex., Houston.—The Guaranty State Bank is reported to have begun business with directors thus: A. C. Bell, president; W. M. Fonville, vice-president; R. F. Butts, cashier; D. F. Wade, assistant cashier; G. M. Anderson, H. E. Detering, J. F. Crawford, William Fuchs, M. G. Fakes and F. E. Pye. D. F. Wade will be assistant cashier.

Tex., Hutto.—Official: The Hutto National Bank is to be incorporated with $25,000 capital stock paid up; J. S. Holman, president; R. B. Hutto, vice-president, and A. B. Walling, cashier.

Tex., Nacogdoches.—It is reported that a new State bank is being organized by E. A. Blount, John Schmidt, G. C. Ingraham, V. E. Simpson and others.

NEW SECURITIES.

Ala., Gadsden.—An election will probably be held to vote on $75,000 of school bonds.

Ala., Montgomery.—Reported that N. W. Hasley & Co. of Chicago have purchased $50,000 of 5 per cent. street-paving bonds.

Ala., Oakman.—Official: February 7 election will be held to vote on $20,000 of 20-year water, light and sewerage bonds. A. A. Wall is Mayor.

Fla., Kissimmee.—Reported that the question of issuing $50,000 of water and sewer bonds is being considered.

Ga., Columbus.—An ordinance has been introduced in the City Council providing for an issue of $100,000 of 4½ per cent. 30-year bridge bonds.

Ga., Edison.—Voted: $33,000 of 5 per cent. water, light and school bonds.

Ga., Savannah.—An official letter says that issue is merely proposed for $300,000 for drainage.

Ky., Covington.—Bids will be received until 5 P. M. January 3 by H. G. Klostermann, city clerk, for $1448.09 of grading and sidewalk bonds.

La., New Orleans.—Official: The new public improvement bonds recently mentioned are the unsold portion of the issue of $8,000,000 of 4 per cents. authorized November 6, 1906, and dated January 1, 1907. Last May $1,000,000 were sold to a syndicate of New Orleans banks. They are for the extension of sewerage and water systems and the completion of the drainage system, each bond for $1000 maturing in 1942, but may be called by instalments after January 1, 1923. Bonds are offered by advertisement for 30 days when to be sold. Board of Liquidation is in charge.

La., Robeline.—Official: $14,000 of bonds authorized for completion of schools. Address superintendent of schools.

La., St. Bernard.—Bids will be received until noon February 8 for $165,000 of 5 per cent. 10-40-year bonds of Terre-aux-Boeufs Drainage District. Address B. F. Estopinal, secretary, St. Bernard, La., or H. L. Favrot, attorney, 608 Hennen Bldg., New Orleans, La.

Md., Annapolis.—Bids will be received by Austin L. Crothers, Governor, until noon February 1 for $1,000,000 of series C State roads loan.

Miss., Brookhaven.—The Commercial Bank of Brookhaven is reported to have been awarded $12,000 of city hall bonds.

Miss., Mathiston.—A resolution is reported passed by the town council authorizing an issue of $20,000 of water and $10,000 of sidewalk bonds.

Mo., Kansas City.—Reported that an election is to be held April 5 to vote on $875,000 of traffic way bonds.

N. C., Greensboro.—Official: March 1 an election will be held to vote on $35,000 of 5 per cent. 30-year school bonds; denomination, $1000; E. J. Stafford, Mayor.

N. C., Wilmington.—N. W. Halsey & Co. of New York are reported to have been awarded at a premium $100,000 of 4½ per cent. 40-year street-improvement bonds.

Okla., Frederick.—R. J. Edwards of Oklahoma City is reported to have been awarded $20,000 of water-works extension, $20,000 of city-hall and $10,000 of sewer-extension bonds at 101.

Okla., Oklahoma City.—Official: December 6 city authorized $210,000 of 5 per cent. 25-year water, incinerator and real estate bonds; de-

SAFE DEPOSIT AND TRUST CO.

OF BALTIMORE

13 SOUTH STREET

Chartered 1864 **Capital, $600,000** **Surplus, $1,800,000**

Acts as Trustee of Corporation Mortgages. Fiscal Agent for Corporations and Individuals, Transfer Agent and Registrar. Depository under plans of reorganization.

Acts as Executor, Administrator, Guardian, Trustee, Receiver, Attorney and Agent, being especially organized for careful management and settlement of estates of every character.

Fireproof Building with latest and best equipment for safety of contents.

Safes for rent in its large fire and burglar-proof vaults, with spacious and well-lighted coupon rooms for use of patrons.

Securities held on deposit for Out-of-Town Corporations and persons.

DIRECTORS:

MICHAEL JENKINS, President
H. WALTERS, Vice-Pres't — WALDO NEWCOMER — SAM'L M. SHOEMAKER
JOHN W. MARSHALL, 2nd Vice-Pres't — NORMAN JAMES — BLANCHARD RANDALL
JOHN J. NELLIGAN, 3rd Vice-Pres't — DOUGLAS H. THOMAS — E. H. PERKINS

ANDREW P. SPAMER, Treasurer — GEO. B. GAMMIE, Asst. Treasurer
H. H. M. LEE, Secretary

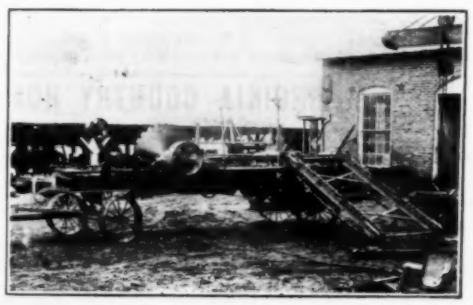
Castell & Trefny

Dealers in High-Grade Bonds and Stocks and Making a Specialty in the Handling of School, County and Municipal Bonds. : : : : : : : : : :

We have in our Bond Department high-class investment securities suitable for individuals, trust funds or estates, the soundness of which is unquestionable and their attractiveness to outside investors being greatly enhanced by the repeal of the mortgage tax in Louisiana.

633 Gravier Street, New Orleans, La.

The Only Up-to-Date Way to Get Out



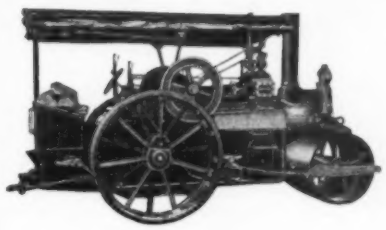
CROSS TIES

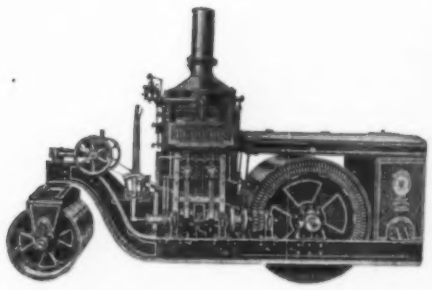
and save the waste of Stumpage

The Standard Cross Tie Machine Co. New Orleans, La.

THE IROQUOIS IRON WORKS

STEAM ROLLERS





THE AMERICAN STANDARD

FIFTEEN YEARS EXPERIENCE

BUFFALO, N. Y.

nomination, $1000; date, January, 1910. Bids will be asked in about two months. Bob Parman is city clerk.

Okla., Ralston.—Official: Bids will be opened January 17 for $25,000 of 6 per cent. 25-year water system bonds. Address The Mayor.

S. C., Florence.—Official: Bids will be received until 11 A. M. January 31 for $70,000 of 5 per cent. 20-40-year sewerage bonds; denomination, $1000. Address M. D. Lucas, City Clerk and Treasurer.

S. C., Greenville.—A. E. Sussex, Clerk and Treasurer, writes that no plans have been made as yet for issuing bonds, but the matter will doubtless be taken up early in 1910.

Tenn., Jellico.—Reported defeated: $65,000 of water-works bonds.

Tenn., Mount Pleasant.—Official: Bids will be received by W. H. Long, Mayor, until 8 P. M. February 1 for $55,000 of 6 per cent. water-works bonds.

Tenn., Trenton.—Reported that $20,000 of sewer bonds have been voted.

Tenn., Winchester.—The question of issuing $100,000 of Franklin county pike bonds is reported under consideration.

Tex., Austin.—The Attorney-General has approved the following securities: $18,500 of 5 per cent. 10-40-year Olney Independent school district bonds and $10,000 of 5 per cent. 10-40-year Howard county common school district No. 2 school bonds.

Tex., Ballinger.—Official: Election held in Runnels county December 18 to vote on road bonds was defeated; R. S. Griggs, County Judge.

Tex., Brady.—An election is to be held in McCulloch county January 10, it is reported, to vote on bonds for bridges.

Tex., Caldwell.—Burleson county is reported to be offering $215,320 of 5 per cent. levee-building bonds.

Tex., Childress.—The question of holding an election to vote bonds for water-works, sewerage and street paving is reported under consideration.

Tex., Marshall.—Reports state that $50,000 of high-school bonds voted several months ago have been approved by the Attorney-General and are now ready to be offered for sale.

Tex., Mexia.—Reported that $10,000 of school bonds will soon be offered for sale.

Tex., Milano.—Official: January 15 election will be held to vote on $3500 of 5 per cent. 10-20-year school district school-building bonds; J. M. McGee, A. Walf, J. P. White, Milano, Tex., trustees. T. S. Henderson is attorney, Cameron, Tex.

Tex., Orange.—An official letter says that $100,000 of 5 per cent. 10-40-year bonds of Orange county navigation district are being offered at private sale; denomination, $1000; date, October 10, 1909. Address Geo. W. Bancroft, secretary Navigation Board.

Tex., Pendleton.—Official: January 15 election will be held to vote on $7000 of 5 per cent. 40-year school bonds. Bids will be asked about March 1. Address M. V. Southerland.

Tex., Sherman.—Official: In about 30 days the $250,000 of 4½ per cent. 10-40-year Grayson county road bonds will be put on the market; denomination, $1000 and $250; date, January 1, 1910. H. P. Wallace is County Auditor at Sherman, Tex.

Tex., Waco.—Official: An election is called for January 31 to vote on $140,000 of high-school and $135,000 of park 5 per cent. 30-year bonds; denomination, $1000. Date for election may be changed to some time in February. James B. Baker is Mayor and Commissioner and R. B. Dickey City Secretary.

Tex., Wichita Falls.—Official: $20,000 of 4½ per cent. 5-40-year Wichita county jail bonds are ready for sale and delivery at par and accrued interest. M. F. Yeager is County Judge.

At Florence, S. C., bids will be received until 11 A. M. January 31 for $70,000 of 5 per cent. sewerage bonds. *Further particulars will be found in the advertising columns.*

At Wichita Falls, Tex., $20,000 of 4½ per cent. 5-40 year Wichita county jail bonds are being offered. *Further particulars will be found in the advertising columns.*

At Mount Pleasant, Tenn., bids will be received until 8 P. M. February 1 for $55,000 of 6 per cent. 30-year water-works improvement bonds. *Further particulars will be found in the advertising columns.*

FINANCIAL NOTES.

Announcement is made that E. Lowndes Rhett will be in charge of the New York office of E. H. Rollins & Sons, at 43 Exchange Pl.

Reported that the Farmers and Traders' National Bank and the First National Bank of Covington, Ky., have been merged under the name of the latter institution. The capital will be $600,000 and surplus $120,000.

A pamphlet showing the condition of 329 State and 31 national banks in the State of Mississippi at the close of business November 16, 1909, has been issued by E. J. Smith, auditor of public accounts. The total resources amounted to $93,711,136, an increase of $8,969,948 over 1908; loans and discounts, $54,325,960; capital stock paid in, $16,225,280; surplus, $4,108,504; undivided profits, $2,937,138; individual deposits, $46,396,735.

IRON AND STEEL PROSPERITY.

A Conservative Statement from Chairman Gary of the Steel Corporation.

[Special Cor. Manufacturers' Record.]

New York, January 1.

Judge E. H. Gary, chairman of United States Steel Corporation, in a statement to the press of the country today said:

"So far as relates to the iron and steel industry of this country at present, there is little need for an elaborate statement. The figures which are given out from time to time speak for themselves. For the past eight months the new orders received by the subsidiary companies of the United States Steel Corporation have been gratifying. During the month of December the bookings of these companies combined have been about 50,000 tons per day, while their capacity is about 41,000 tons per day. The only concern at the mills is to satisfy customers in regard to deliveries. Unlike former periods, there has of late been little, if any, business taken for speculative purposes; on the contrary, the specifications for prompt delivery are more pronounced than ever before. Following the panic of 1907, which was the result of lack of confidence from various causes, there was a diminution in the buying of ordinary and regular supplies, and, therefore, the necessities of the purchasing public, particularly the railroads, had accumulated to such an extent that orders could no longer be deferred. Consequently, their volume suddenly developed into abnormal proportions. This, with the growth of the country and increasing uses for iron and steel, together with the financial resources of the people, have brought about the great prosperity which is now in evidence.

"There is nothing in sight to indicate there will be any great reduction in the iron and steel trade for the year 1910. Most of the manufacturers have orders which will fully occupy their mills far into the future, and the new business from day to day, which continues active and large, will soon fill the books for the entire year. Of course, there are always possible dangers ahead, such as unjust and unreasonable legislation, or inconsiderate action by public officials, which tend to create distrust and thus postpone commitments for further extensions. Or, what is more probable, there may be overconfidence, overextension, too rapidly rising prices or other mistakes by those who are in charge of important affairs. The lawmakers, the administrators of the law and the active business and financial members of the community are all interested in working together to improve the material as well as the moral conditions of the people, and this will be of great benefit. We have all learned something by experience the past few years. I think there is no one more desirous of maintaining prosperity, so far as the same is consistent with good government, than the President himself."

Expect to Write Big History.

Matthew Addy & Co. of Cincinnati, in their market report of January 1, say:

"Never in the history of the trade do we remember a year that opened with more expected of it than is expected of 1910. The highest hopes are held regarding it. There is not even a minority vote against it. The whole iron and steel trade looks to it to atone for all the worries, losses and disappointments of the panic. It will have to be a wonderful year to realize all that is anticipated, but there is no reason why it should disappoint any of its sincere well-wishers. In fact, we all expect it to write its history as a period of unparalleled activity and prosperity."

Wants Facts About Industries.

Mr. H. V. Watts of San Benito, Tex., in the interest of the material development of the lower Rio Grande country, is seeking detailed information regarding certain industries that he believes would flourish there. He would like to know the cost of the machinery and of other items, such as labor, in the broom-making industry, the number of brooms that may be made from a ton of broom corn, the locations in Texas where broom factories are already established and the names of manufacturers of broom-making machinery. He desires also similar data about the rough cotton-goods industry, the pickling and preserving industries, and small ice plants run in connection with electric-lighting plants.

If You Believe in Signs

why not use good signs? Stafford Signs and Tablets are durable, substantial, yet most effective Signs, that nothing less than earthquake and fire can destroy. Your business sign is your business character—therefore have your signs consistent with your business. Also

Time, Trade and Tool Checks. Letters, all sizes in Bronze, Brass, Aluminum, Glass, etc.
It will pay you to write for Cat. No. 100 TODAY.
N. STAFFORD CO. (Est. 1857)
67 Fulton St., New York

To the 1100 advertisers in this issue
THE HAYWARD CO. ad on page 216
Prepared and Executed by
THE WHITMAN CO.
Practical Advertising
127 Duane St. New York City
Resultful trade journal advertising, catalogs, booklets, folders, etc., planned and executed. Correspondence invited.

WILLIAM LIEBIG & CO.
Manufacturers of Brush Machinery
DETROIT, - - MICH.

HOTEL PLAZA
BROWNWOOD, TEXAS.
J. W. SPANGENBERG, Proprietor.
Everything new and strictly first class, with all modern conveniences; 40 outside rooms, single or en suite, with or without baths. Free sample rooms. Special attention to traveling men. Rates, $2 and up per day.

Special Advertisements of General Interest.

STANDING TIMBER FOR SALE IN GEORGIA

69 million feet Pine—mostly short leaf or "N. C. Pine."
10 million feet Cypress.
39 million feet Oak.
30 million feet Gum.
14 million feet Ash.
2 million feet Poplar, Hickory, Cedar, etc.

164 million feet.

Located on 21,492 acres, about one-third in fee, balance 19 to 29 years' lease. All in condensed tract, favorably situated on two railroads and a navigable river.

We are not manufacturers or brokers, but owners.

THE SIZER TIMBER COMPANY,
15 William St., New York, N. Y.
Care Robert Sizer & Co.

STANDING TIMBER

Several hundred million feet of standing timber in Eastern Virginia and North Carolina for sale in lots of various sizes.
Also 98,000 acres in fee in Florida.
R. B. CHAFFIN & CO., INC.,
Richmond, Va.

THERE ARE MILLIONS IN IT

For Sale—95,000 acres of virgin timber lands in the finest section of Florida; estimated cut, 450,000,000 ft. of merchantable L. L. yellow pine, 250,000,000 ft. of merchantable red cypress and 50,000,000 ft. of oak, ash, maple and gum; 50,000 acres of this tract underlaid with over 30 ft. of carbonate of lime; analysis, 95 to 98 per cent.; also deposits of marl and cement. 155 acres in fine kaolin clay in Central Georgia. A special bargain in 225,000 acres of virgin pine and cypress in South Florida. Write for further information to JAS. A. HARLEY, Sparta, Ga.

Handle Plant
FOR SALE
If you want to buy one of the best located Hickory Tool and Plow Handle Plants in the South, now running, write
Galax Handle Works, Inc.
GALAX, VA.

Furniture Factory for Sale

At 50 cents on the $1, on easy terms, a modernly equipped furniture factory, well located on C. & O. Railroad in the heart of the lumbering district of West Virginia. Write
C. H. THOMPSON, Trustee,
Ronceverte, W. Va.

WANTED
10,000 TO 20,000 ACRES OF LAND
In NORTH CAROLINA, GEORGIA, ALABAMA, or TENNESSEE, for COLONIZING purposes. Not necessary to have Timber or Coal thereon, although same would not be an objection.
Must be contiguous to Railroads.
JAS. W. DRAPE & CO.
REAL ESTATE, ETC.
Suite 512 and 513 Farmers Bank Bldg.
Wood St. and 5th Ave., Pittsburgh, Pa.

FOR SALE
Valuable Iron Property
IN VIRGINIA
Consisting of 14,500 acres of fee lands, mostly covered with timber, containing iron-ore deposits of several million tons in sight, running from 40 to 50 per cent.; limestone deposits of good grade, a blast furnace and private railroad; is well located as to market, has good railway connections, possesses unusual advantages and affords a fine opportunity for profitable investment.
J. T. JACKSON & CO.,
Chestnut and 13th Sts., Philadelphia, Pa.

WOODWORKING MILL
For Sale at a Bargain
With necessary machinery for manufacture of sash, doors and blinds. Will sell on easy terms. Write
FIRST NATIONAL BANK,
Newport News, Va.

VIRGINIA COUNTRY HOMES
A beautifully illustrated periodical. For free copy and list of 200 select properties in best parts of State apply to
H. W. HILLEARY & CO.,
Charlottesville, Va.
Branch Offices—Richmond, Va.; Fredericksburg, Va.; Warrenton, Va.; Culpeper, Va.; Leesburg, Va.

WANTED
One Hundred Thrifty Farmers
Large means not necessary, to occupy large or small farms; easy terms, or cash. Fertility of soil unsurpassed. Soil easily cultivated and productive. Golden opportunity. For particulars address W. J. Edwards, Fourth National Bank, Atlanta, Ga.

Maryland Not Malarial.

One of the most valuable contributions to the cause of immigration to Maryland made in the latest report of the State Bureau of Immigration is the publication of a statement of Dr. Marshall L. Price, secretary of the State Board of Health, containing the following:

"I do not believe there has been a death from malaria in Maryland since 1893. An error in diagnosis is plainly apparent in the majority of cases on the death certificate, and such so-called cases of malaria are recorded as frequently in the winter months as in the summer and autumn. Malaria was quite prevalent in Baltimore during 1893, but since that time, for some unexplained reason, it has practically disappeared from the State.

"During the year beginning May 1, 1908, and ending April 30, 1909, 270 specimens were examined in the State laboratory. Of these, only two were positive. Of these two cases, one was reported from Oakland, Garrett county, in which there was a chill every second day, remittent fever, hematuria and jaundice, and the tertian malaria parasite was found in the blood. The other case was reported from Govanstown, Baltimore county, in which symptoms were chill and remittent fever. The parasite was also found in the blood, but the veriety is not shown by the records. The laboratory specimens are received from every part of Maryland, and, if malaria is at all prevalent, it would at once appear in our laboratory records.

"During the past five or ten years Dr. Wm. T. Watson has made a special investigation into the prevalence of malaria in Maryland. His inquiries have been addressed to the leading practitioners of various parts of the State, and those upon whose diagnosis most dependence could be placed. It appears from this investigation during this period malaria is rarely found along the Susquehanna River, Bush River, Gunpowder River, Severn River, Patuxent River and the Potomac River below Washington. On the Eastern Shore malaria has occurred very rarely along the Choptank River, Wicomico River and the Manokin River. The Sassafras River, upon which Betterton is situated, has, as far as we can learn, been exempt during this time. Chances of contracting malaria fever in Maryland would be considerably less than in Pennsylvania."

It has been announced that at a meeting of the bondholders of the Rockingham Power Co. in New York, at which 97 per cent. of the bonds were represented, the independent bondholder plan proposed by North Carolina interest was substituted for the plan of the reorganization committee and a committee composed of J. P. Council and Hugh MacRae of Wilmington, N. C., and Robert E. McCorick of Chicago was appointed to put the plan in effect.

It is believed now that the obstacles to the successful financing of the development are out of the way, and that the property will be speedily completed along the plan contemplated by the original promoters.

IN ORDER to promptly complete the erection of a LARGE REFINERY, equipping same with the most modern machinery and begin operations on a very extensive scale to fill orders in hand, The Southern States Cotton Oil Refining Company, Wilmington, N. C., is offering for sale a limited number of its first mortgage 20 year, sinking fund 6% (semi-annual) GOLD BONDS at $1000 each and accrued interest with a bonus of 50% in COMMON STOCK. This is UNQUESTIONABLY a CONSERVATIVE as well as a REMUNERATIVE and PROFITABLE investment.

Early correspondence and subscriptions invited to this limited issue.

Address for full particulars,

WM. H. FORMAN
Suite 908-9-10 160 BROADWAY
New York, U. S. A.

LET YOUR LIGHTS SHINE AFTER THE DYNAMO SHUTS DOWN

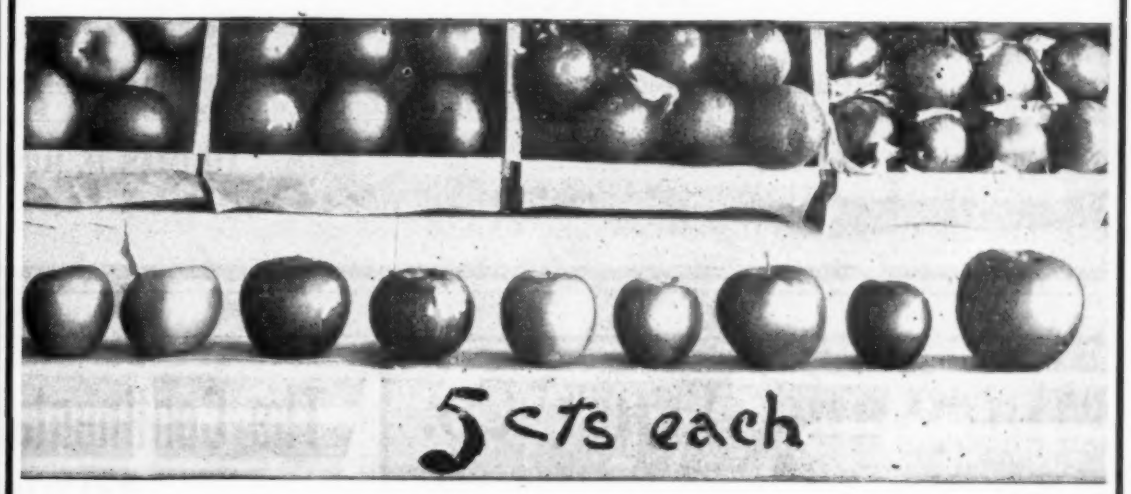
If you have a storage battery, you charge it when the dynamo is running and it supplies lights for factory, office or home after the dynamo has been shut down. Ask us to tell you why—how—and the moderate cost. This Company's batteries are used by all the largest Electric Light Companies in America. Why not you?

THE ELECTRIC STORAGE BATTERY CO. 1888 1910
PHILADELPHIA, PA.
New York, Boston, Chicago, St. Louis, Cleveland, Atlanta, San Francisco, Toronto

A "comedy of errors" is not a frequent experience in a salesman's routine, and the instance to be related by NATIONAL TUBE COMPANY, Pittsburgh, Pa., in next week's issue of Manufacturers' Record will interest all users of gasketless unions.

INTERSTATE AUDIT COMPANY

729 15th Street N. W., WASHINGTON, D. C.
DEVISERS OF BUSINESS SYSTEMS
MINIMIZING AND SIMPLIFYING ACCOUNTING METHODS



Which Would You Choose?

IF YOU SAW A ROW OF APPLES, every one differing in size, ripeness and color, and all for sale at the same price, wouldn't you choose the best? Why not do the same thing when you buy fire insurance? The cost of insurance is substantially the same in all companies, but what you get for your money varies as much as the apples in this row.

Choose the **Hartford Fire Insurance Company.** For 99 years it has paid every honest loss, big and little. Its reputation is unexcelled. It is the best fire insurance apple of them all, and its policies cost no more than those of inferior quality. **Why not use the same good judgment in buying insurance that you do in buying goods for your store, clothes for your family, or even in such a trivial matter as buying apples from the fruit stand? And the next time you insure,**

Insure in the Hartford
Agents Everywhere

SAFETY

"Out of 1723 total banking failures (in the United States) within the last fifteen years, the National Banks contributed 341, State Banks 524, Private Banks 631, Savings Banks 158 and TRUST COMPANIES only 69."—Trust Companies' Magazine, January, 1908, after the panic of 1907.

After Twenty Years of Continuous Service

The Baltimore Trust & Guarantee Co.

Baltimore, Md.

Invites { Accounts subject to check
Accounts for definite periods
Accounts for savings

THE COMPANY'S GUARANTEE TO ITS DEPOSITORS IS $2,800,000 IN CAPITAL AND SURPLUS AND THE FURTHER CAPITAL STOCK LIABILITY OF $800,000—TOTAL $3,600,000.

THOMAS H. BOWLES, President.

Maryland Trust Co.

N. W. COR. CALVERT AND GERMAN STREETS

BALTIMORE, MD.

CAPITAL $2,000,000

TRANSACTS A GENERAL TRUST AND BANKING BUSINESS

Interest Allowed on Deposits Subject to Check.
Special Rates on Time Deposits.

Acts as Trustee under Mortgages of Railroads and other Corporations; as Depositary under Plans of Reorganization; as Financial Agent for Corporations and Individuals, and as Agent for the Transfer and Registration of Stocks and Bonds, and for the payment of Interest and Dividends.

A Legal Depository for Court and Trust Funds

SAFE DEPOSIT BOXES FOR RENT.

CORRESPONDENCE AND INTERVIEWS INVITED

OFFICERS

L. S. ZIMMERMAN.....Acting President
J. V. McNEAL.....Vice-President
CARROLL VAN NESS.....Secretary
JERVIS SPENCER, Jr.....Treasurer
IVAN SKINNER..... { Asst. Secretary / Asst. Treasurer

DIRECTORS

Josiah L. Blackwell, G. Clymer Brooke, Joseph R. Foard, B. Howell Griswold, Jr., George Garr Henry, A. Barton Hepburn, Grier Hersh, John T. Hill, George C. Jenkins, J. V. McNeal, Oscar G. Murray, Henry F. Shoemaker, James Speyer, Douglas M. Wylie, L. S. Zimmerman.

The Continental Trust Company

BALTIMORE, MD.

Capital - - - - - $1,350,000
Surplus and Undivided Profits 2,400,000

Transacts a General Trust Company Business

Special Attention Given to Collections

Accounts of Banks and Trust Companies received on liberal terms

Depositary for the City of Baltimore

President, S. DAVIES WARFIELD
Vice-Pres., THOMAS M. HULINGS — Treasurer, F. C. DREYER
Secretary, H. A. BEASLEY — Asst. Treas., MAURICE H. GRAPE
Trust Officer, B. HYLAND COX — Asst. to Pres., W. J. CASEY

CORRESPONDENCE INVITED

The Merchants National Bank

OF

BALTIMORE, MARYLAND

DOUGLAS H. THOMAS, President — WILLIAM INGLE, Vice-President and Cashier

J. CLEVELAND WANDS, Ass't Cashier — JOHN B. H. DUNN, Ass't Cashier

STATEMENT OF CONDITION

December 30, 1909, after closing entries for six months

Report of the Condition of the Merchants National Bank of Baltimore, Md., at the close of business, December 30, 1909.

RESOURCES

Demand Collateral Loans		$2,946,760 50
Time Collateral Loans		2,112,043 86
Bills Receivable		3,869,896 44
United States Bonds		775,000 00
Other Securities Owned		257,295 00
		$9,960,995 80
Banking House and Lot		370,000 00
Five per cent. Redemption Fund		33,750 00
Exchange for Clearing-House		437,345 24
Due from Reserve Agents (New York Exchange)		619,229 13
Other Eastern Exchange subject to check		250,000 00
Due from other Banks and Bankers		1,522,843 57
Cash		1,818,574 00
		$15,012,737 74

LIABILITIES

Capital Stock		$1,500,000 00
Surplus Fund	$900,000 00	
Undivided Profits, net	106,671 68	
		1,006,671 68
Dividend payable January 3, 1910		67,500 00
Circulation		672,000 00
Bonds Borrowed		75,000 00
Bank Deposits	$6,530,030 95	
Individual Deposits	5,161,535 11	
		11,691,566 06
		$15,012,737 74

Appreciating the needs of Southern Banks and Bankers,

THE MERCHANTS NATIONAL BANK OF BALTIMORE

will be glad to receive from them for attention such part of their business as might naturally seek Baltimore for collection.

To such banks as do not make a practice of borrowing continuously throughout the year it is usually possible to extend such accommodations as is warranted by average balances. Correspondence invited.

Baltimore, Dec. 30, 1909 — **WILLIAM INGLE, Cashier**

FIDELITY AND SURETY BONDS

Fidelity and Deposit Company of Maryland

BALTIMORE, MARYLAND

IT HAS—Capital,	- - -	$2,000,000.00
Surplus,	- - -	2,500,000.00
Resources,	- - -	1,673,688.63
Total Assets,	- -	$6,173,688.63

It is the PIONEER SURETY COMPANY of the SOUTH.

It has paid in losses to patrons since its organization $7,000,180.86

If you are required to give a bond yourself, or if you are requiring bonds from others, you should get the best possible protection.

This Company furnishes the surest and best security you can get.

It costs no more to get the best.

EDWIN WARFIELD,
President.

THE
National Exchange Bank
of
Baltimore, Md.

Hopkins Place, German and Liberty Streets

OFFICERS

WALDO NEWCOMER, President
SUMMERFIELD BALDWIN, V.-Pres. WM. J. DELCHER, Asst. Cashier
R. VINTON LANSDALE, Cashier CLINTON G. MORGAN, Asst. Cashier

Capital, - - - - - - $1,000,000.00

November 16, 1909

Surplus and Earnings, - $724,906.55

FOREIGN EXCHANGE
LETTERS OF CREDIT
SAFE DEPOSIT BOXES

Accounts Invited

Efficient Service and Courteous Treatment Assured

The Commercial National Bank

of CHICAGO

Capital, Surplus and Undivided Profits, $10,300,000

Deposits, $70,000,000

OFFICERS

EDWARD S. LACEY.....Chairman of the Board

GEORGE E. ROBERTS	President	FRANK P. JUDSON	Secretary
RALPH VAN VECHTEN	Vice-Pres't	GEO. B. SMITH	Asst. Cashier
JOHN C. CRAFT	Vice-Pres't	HARVEY C. VERNON	Asst. Cashier
W. T. BRUCKNER	Vice-Pres't	H. ERSKINE SMITH	Asst. Cashier
DAVID VERNON	Vice-Pres't	CHARLES C. WILLSON	Asst. Cashier
ROBERT M. WELLS	Vice-Pres't	RALPH C. WILSON	Asst. Cashier
NATHANIEL R. LOSCH	Cashier	EDWARD M. LACEY	Asst. Cashier

DIRECTORS

WILLIAM J. CHALMERS	EDWARD P. RUSSELL	CHARLES T. BOYNTON
ROBERT T. LINCOLN	ALFRED COWLES	FRANCIS A. HARDY
E. H. GARY	EAMES MAC VEAGH	JAMES W. STEVENS
DARIUS MILLER	MILTON H. WILSON	HERBERT F. PERKINS
JOSEPH T. TALBERT	MICHAEL CUDAHY	RALPH VAN VECHTEN
WILLIAM V. KELLEY	DANIEL H. BURNHAM	JOHN C. CRAFT
ROBERT H. McELWEE	RICHARD C. LAKE	GEORGE E. ROBERTS
ALEXANDER F. BANKS	CHARLES H. WEAVER	EDWARD C. LACEY

This bank is pleased to place at the disposal of its customers the facilities gained during forty-five years of continuous service and growth.

00

retary
Cashier
Cashier
Cashier
Cashier
Cashier

ON
NS
KINS
HTEN

BERTS
ACEY

l of
rty-
wth.